

Appendix Test Data for BT(BDR/EDR) (Conducted Measurement)

Product Name: Outdoor LoRa Gateway

Trade Mark: Dusun

Test Model: DSGW-014

FCC ID: 2AUXBDSGW-014

Environmental Conditions

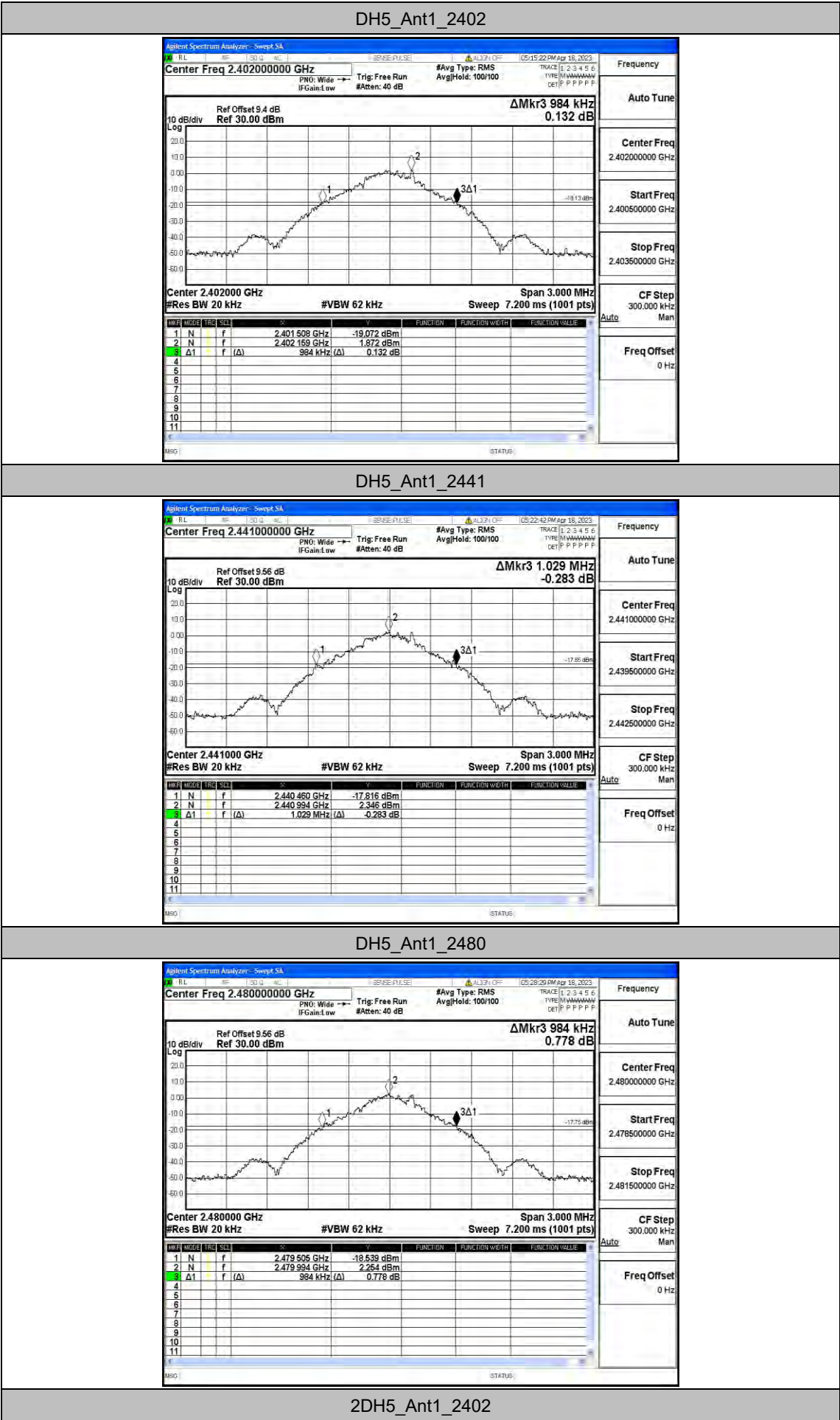
| | |
|--------------------|-----------|
| Temperature: | 22.7°C |
| Relative Humidity: | 56% |
| ATM Pressure: | 100.0 kPa |
| Test Engineer: | Anna Hu |
| Supervised by: | Hugo Chen |
| NOTE | N/A |

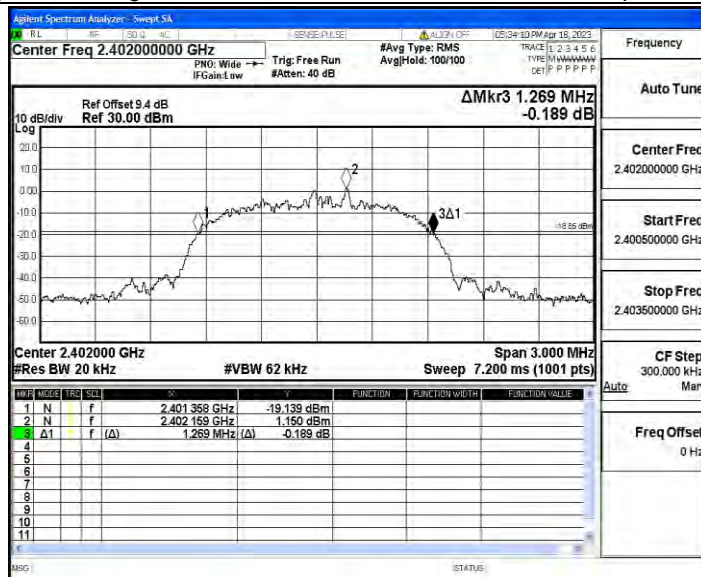
Appendix A: 20dB Emission Bandwidth

Test Result

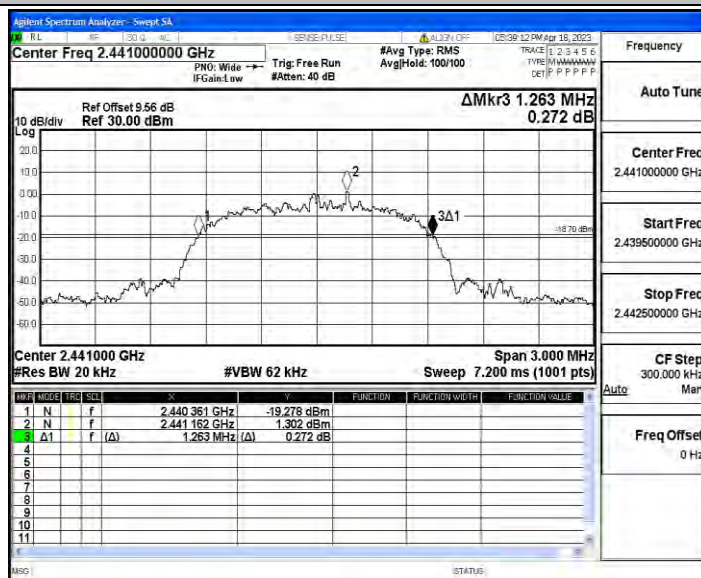
| TestMode | Antenna | Channel | 20db EBW[MHz] | FL[MHz] | FH[MHz] | Limit[MHz] | Verdict |
|----------|---------|---------|------------------|----------|----------|------------|---------|
| DH5 | Ant1 | 2402 | 0.984 | 2401.508 | 2402.492 | --- | --- |
| | | 2441 | 1.029 | 2440.460 | 2441.489 | --- | --- |
| | | 2480 | 0.984 | 2479.505 | 2480.489 | --- | --- |
| 2DH5 | Ant1 | 2402 | 1.269 | 2401.358 | 2402.627 | --- | --- |
| | | 2441 | 1.263 | 2440.361 | 2441.624 | --- | --- |
| | | 2480 | 1.266 | 2479.361 | 2480.627 | --- | --- |
| 3DH5 | Ant1 | 2402 | 1.236 | 2401.382 | 2402.618 | --- | --- |
| | | 2441 | 1.272 | 2440.349 | 2441.621 | --- | --- |
| | | 2480 | 1.230 | 2479.379 | 2480.609 | --- | --- |

Test Graphs

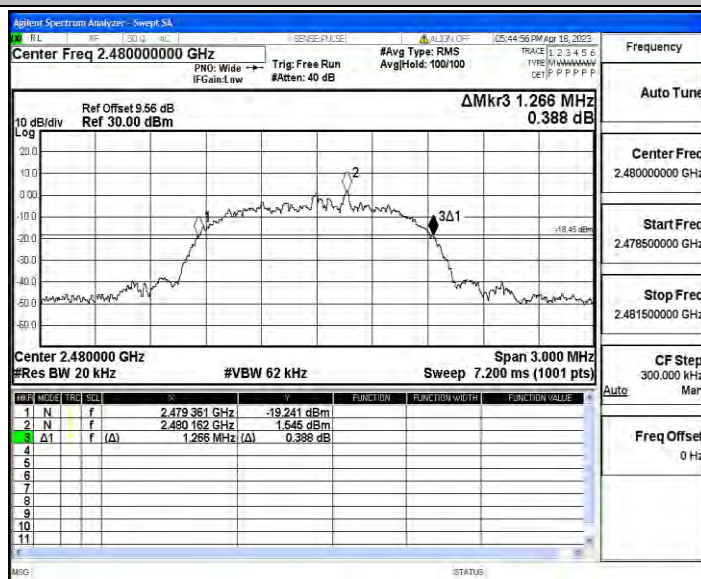




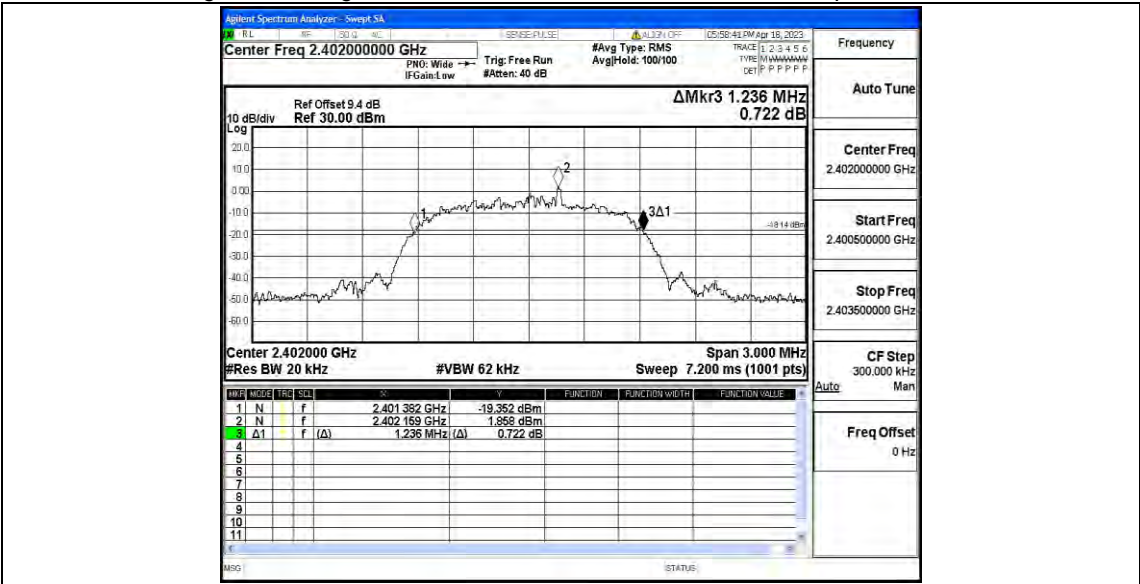
2DH5_Ant1_2441



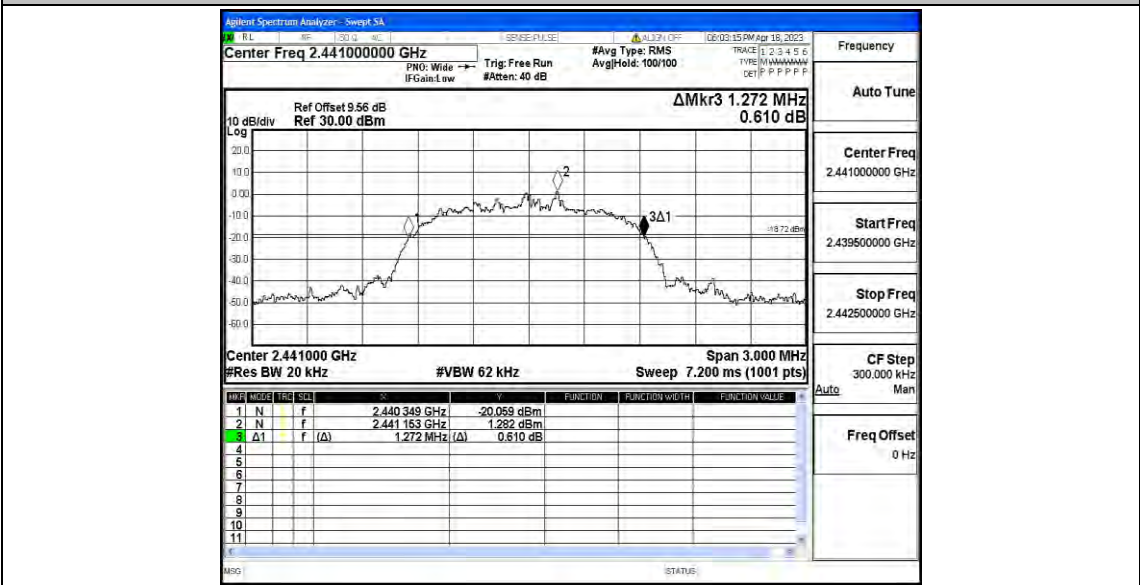
2DH5_Ant1_2480



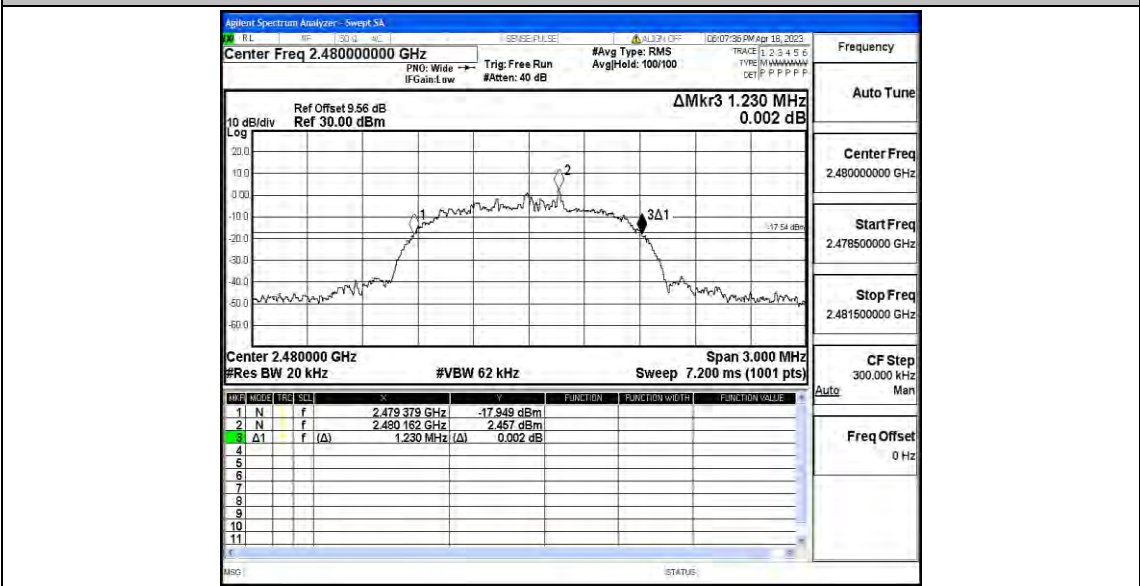
3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480

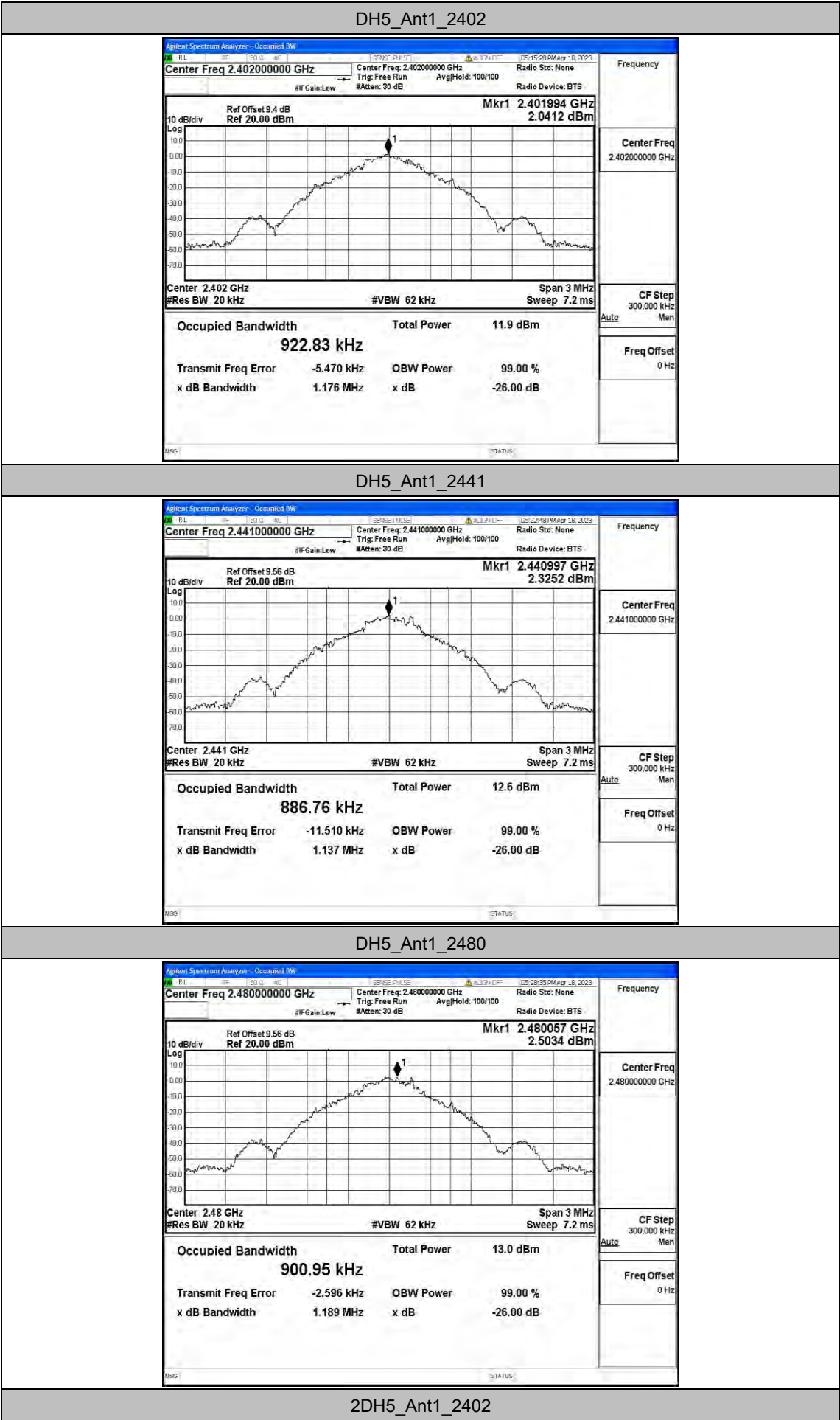


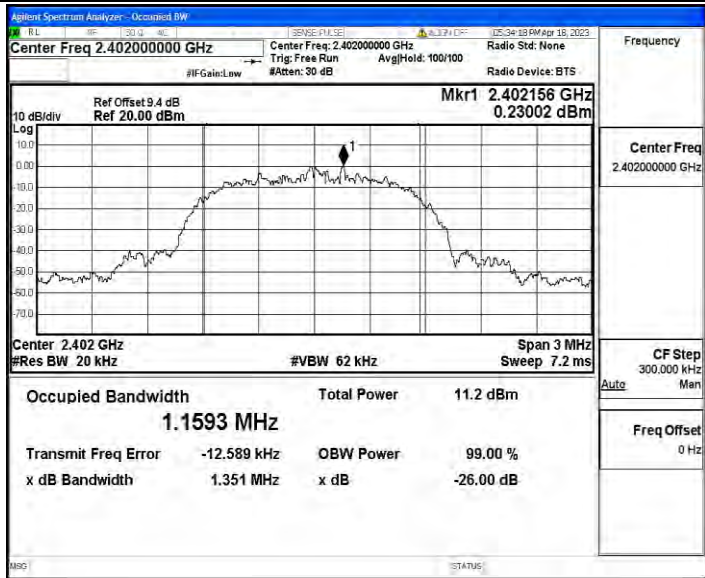
Appendix B: Occupied Channel Bandwidth

Test Result

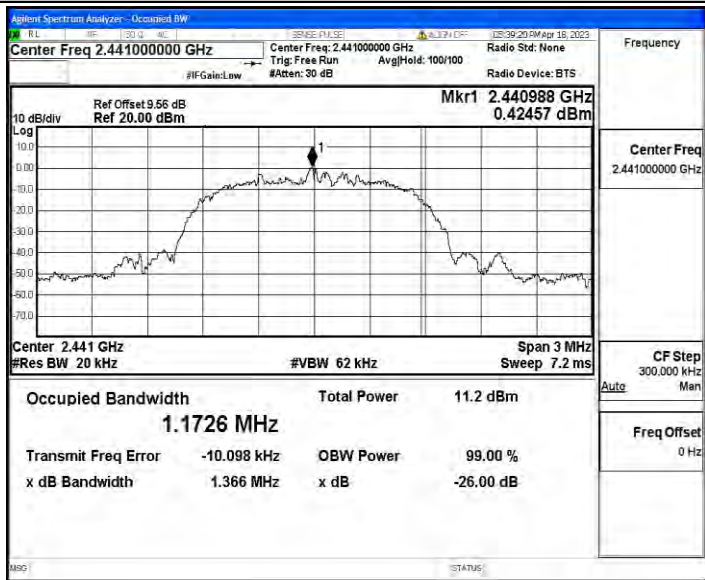
| TestMode | Antenna | Channel | OCB [MHz] | FL[MHz] | FH[MHz] | Limit[MHz] | Verdict |
|----------|---------|---------|-----------|-----------|-----------|------------|---------|
| DH5 | Ant1 | 2402 | 0.92283 | 2401.5331 | 2402.4559 | --- | --- |
| | | 2441 | 0.88676 | 2440.5451 | 2441.4319 | --- | --- |
| | | 2480 | 0.90095 | 2479.5469 | 2480.4479 | --- | --- |
| 2DH5 | Ant1 | 2402 | 1.1593 | 2401.4078 | 2402.5671 | --- | --- |
| | | 2441 | 1.1726 | 2440.4036 | 2441.5762 | --- | --- |
| | | 2480 | 1.1748 | 2479.4048 | 2480.5796 | --- | --- |
| 3DH5 | Ant1 | 2402 | 1.1709 | 2401.4088 | 2402.5797 | --- | --- |
| | | 2441 | 1.1650 | 2440.4155 | 2441.5805 | --- | --- |
| | | 2480 | 1.1577 | 2479.4182 | 2480.5759 | --- | --- |

Test Graphs





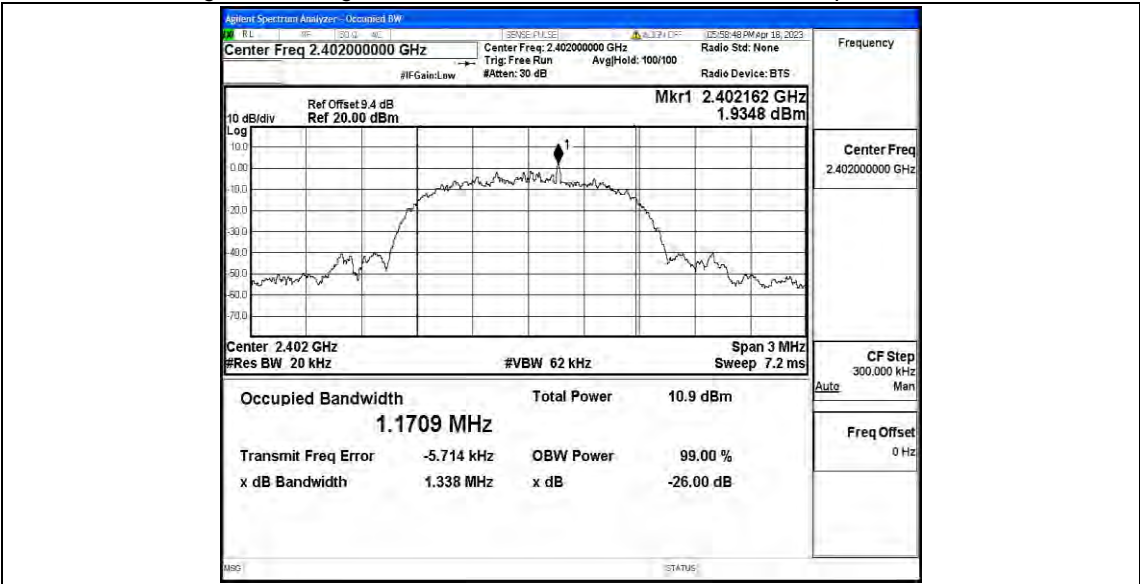
2DH5_Ant1_2441



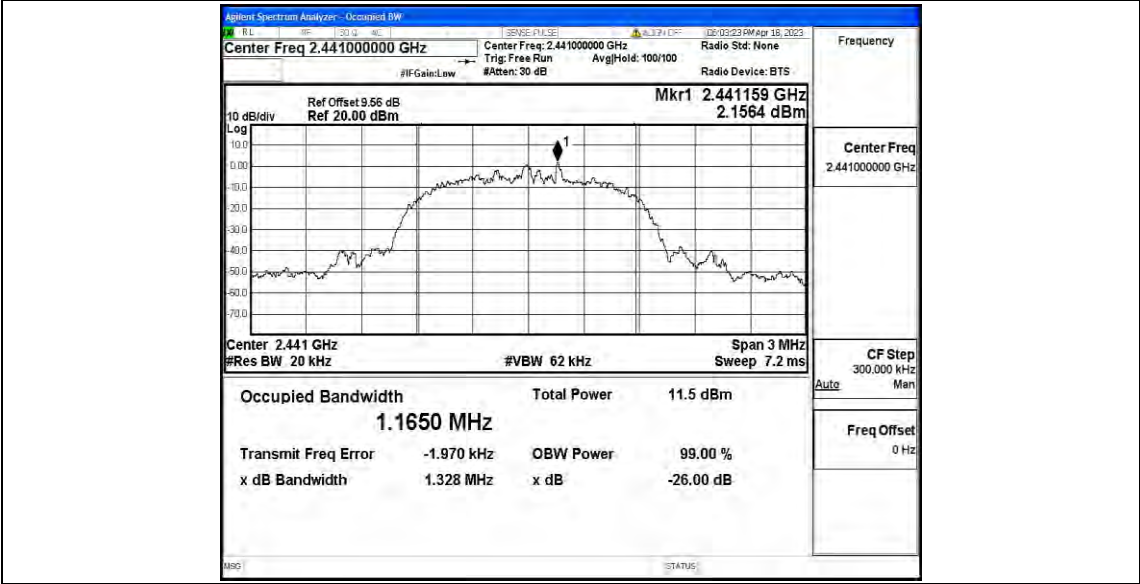
2DH5_Ant1_2480



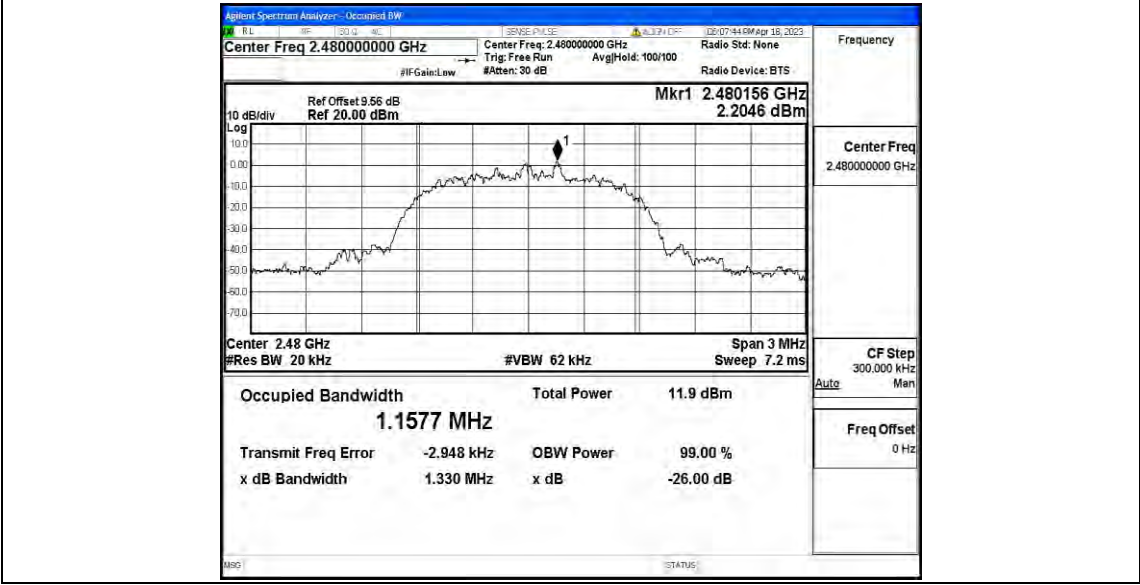
3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480

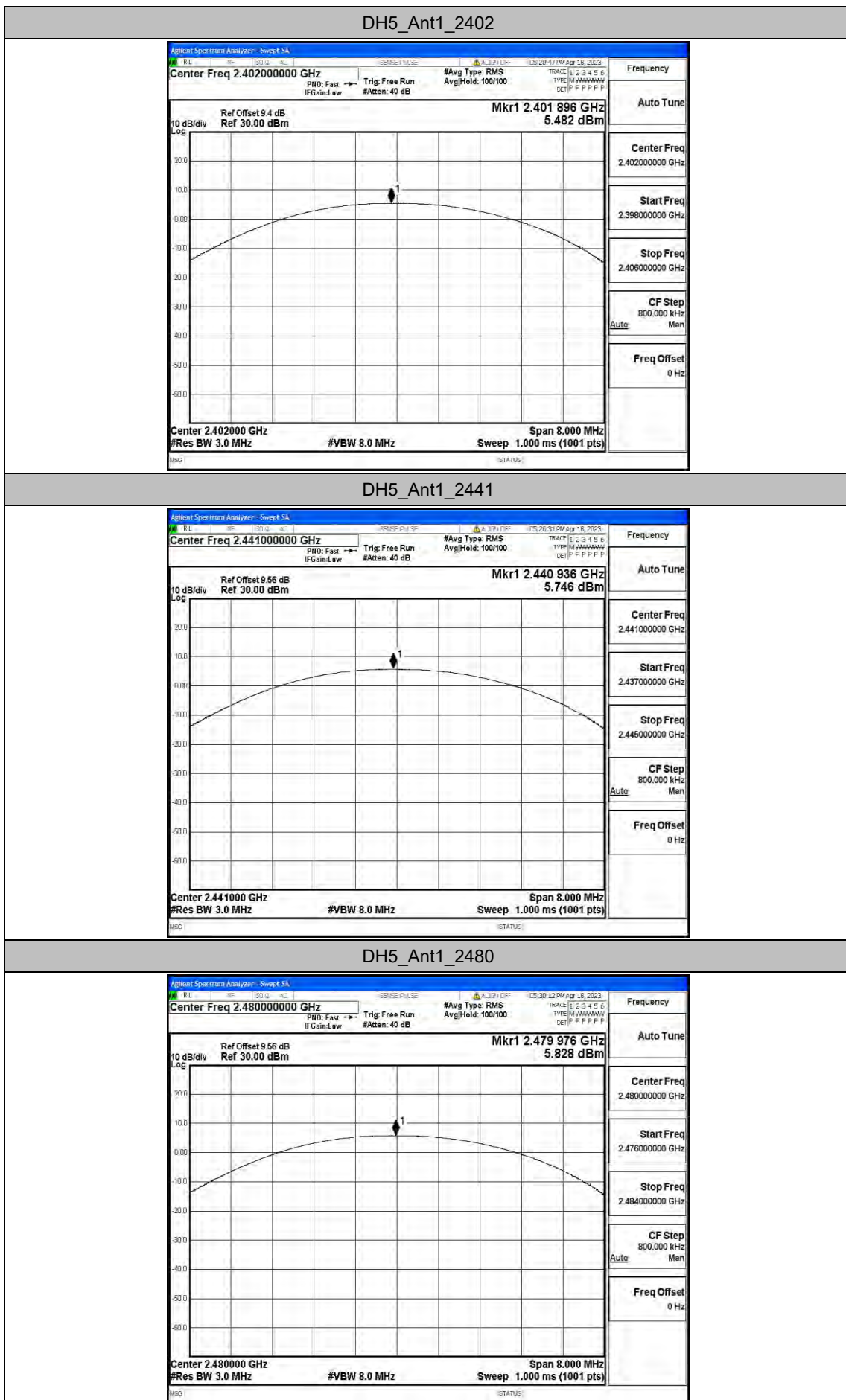


Appendix C: Maximum Peak conducted output power

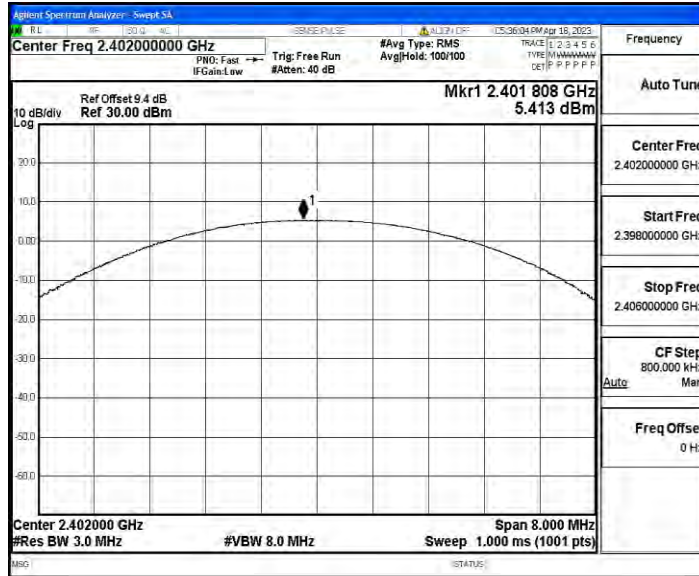
Test Result

| TestMode | Antenna | Channel | Result[dBm] | Limit[dBm] | Verdict |
|----------|---------|---------|-------------|------------|---------|
| DH5 | Ant1 | 2402 | 5.48 | ≤20.97 | PASS |
| | | 2441 | 5.75 | ≤20.97 | PASS |
| | | 2480 | 5.83 | ≤20.97 | PASS |
| 2DH5 | Ant1 | 2402 | 5.41 | ≤20.97 | PASS |
| | | 2441 | 5.74 | ≤20.97 | PASS |
| | | 2480 | 5.83 | ≤20.97 | PASS |
| 3DH5 | Ant1 | 2402 | 5.81 | ≤20.97 | PASS |
| | | 2441 | 6.17 | ≤20.97 | PASS |
| | | 2480 | 6.36 | ≤20.97 | PASS |

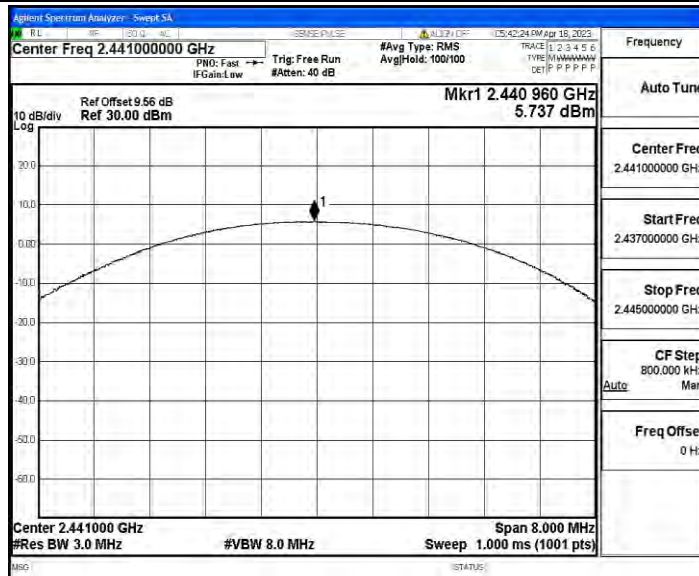
Test Graphs



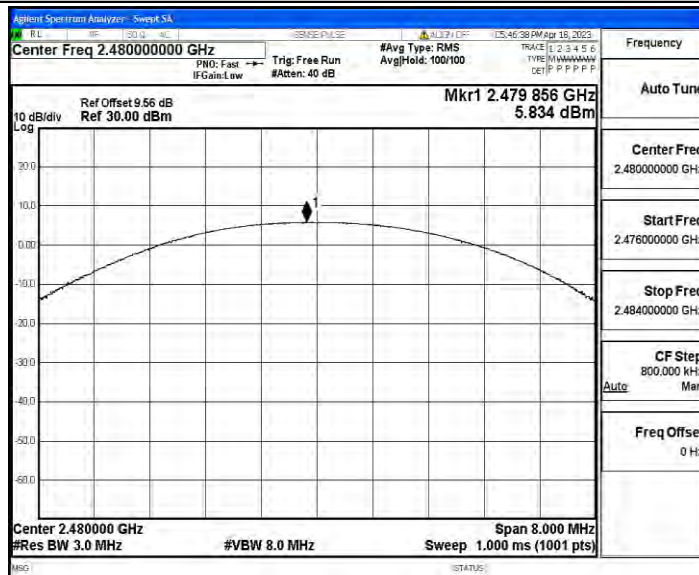
2DH5_Ant1_2402



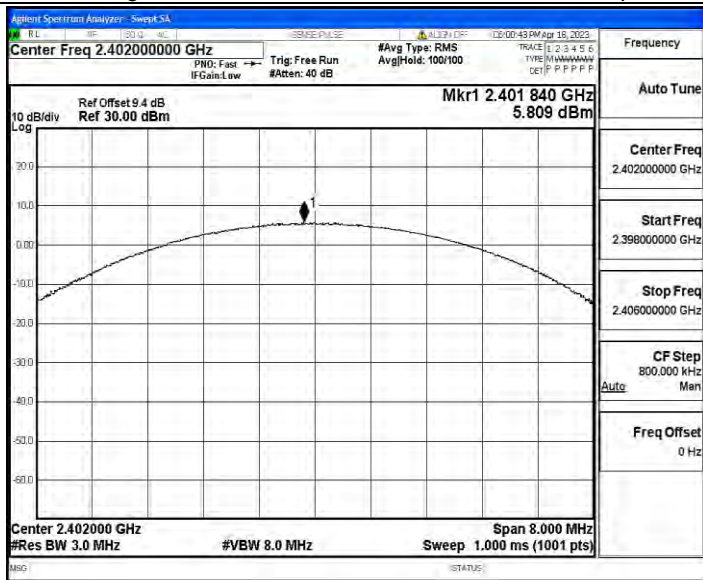
2DH5_Ant1_2441



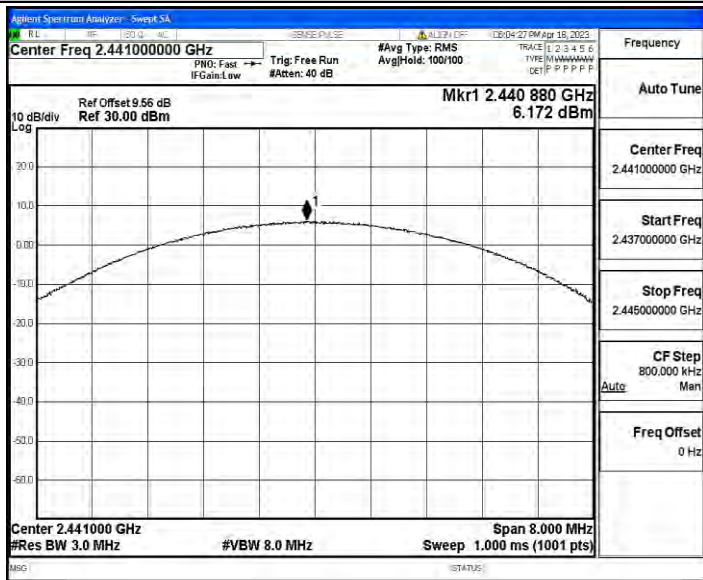
2DH5_Ant1_2480



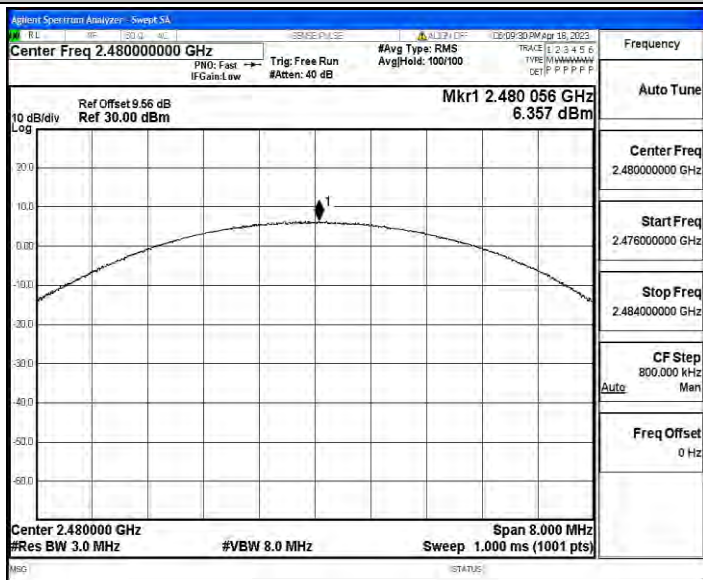
3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480

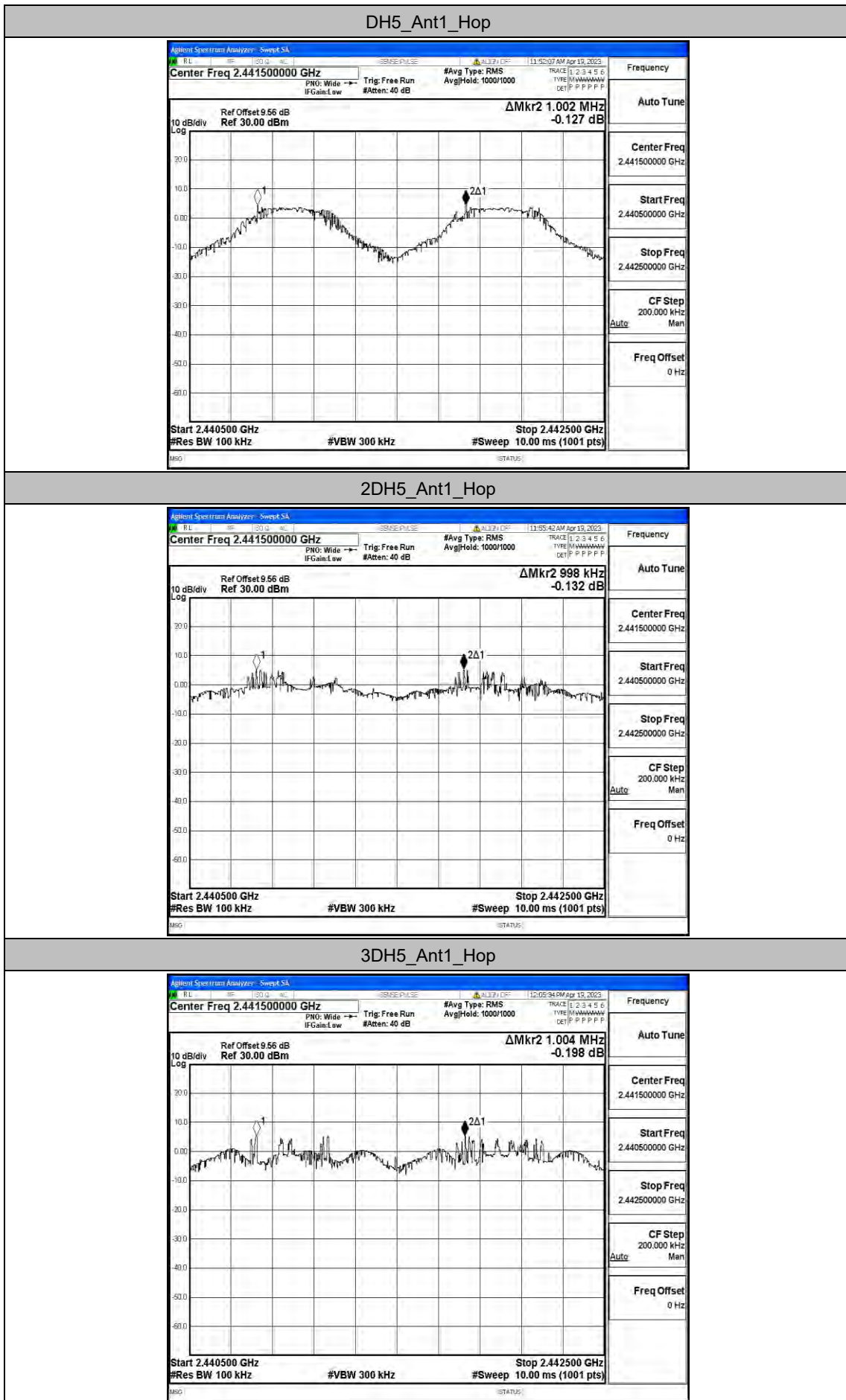


Appendix D: Carrier frequency separation

Test Result

| TestMode | Antenna | Channel | Result[MHz] | Limit[MHz] | Verdict |
|----------|---------|---------|-------------|--------------|---------|
| DH5 | Ant1 | Hop | 1.002 | ≥ 0.686 | PASS |
| 2DH5 | Ant1 | Hop | 0.998 | ≥ 0.846 | PASS |
| 3DH5 | Ant1 | Hop | 1.004 | ≥ 0.848 | PASS |

Test Graphs

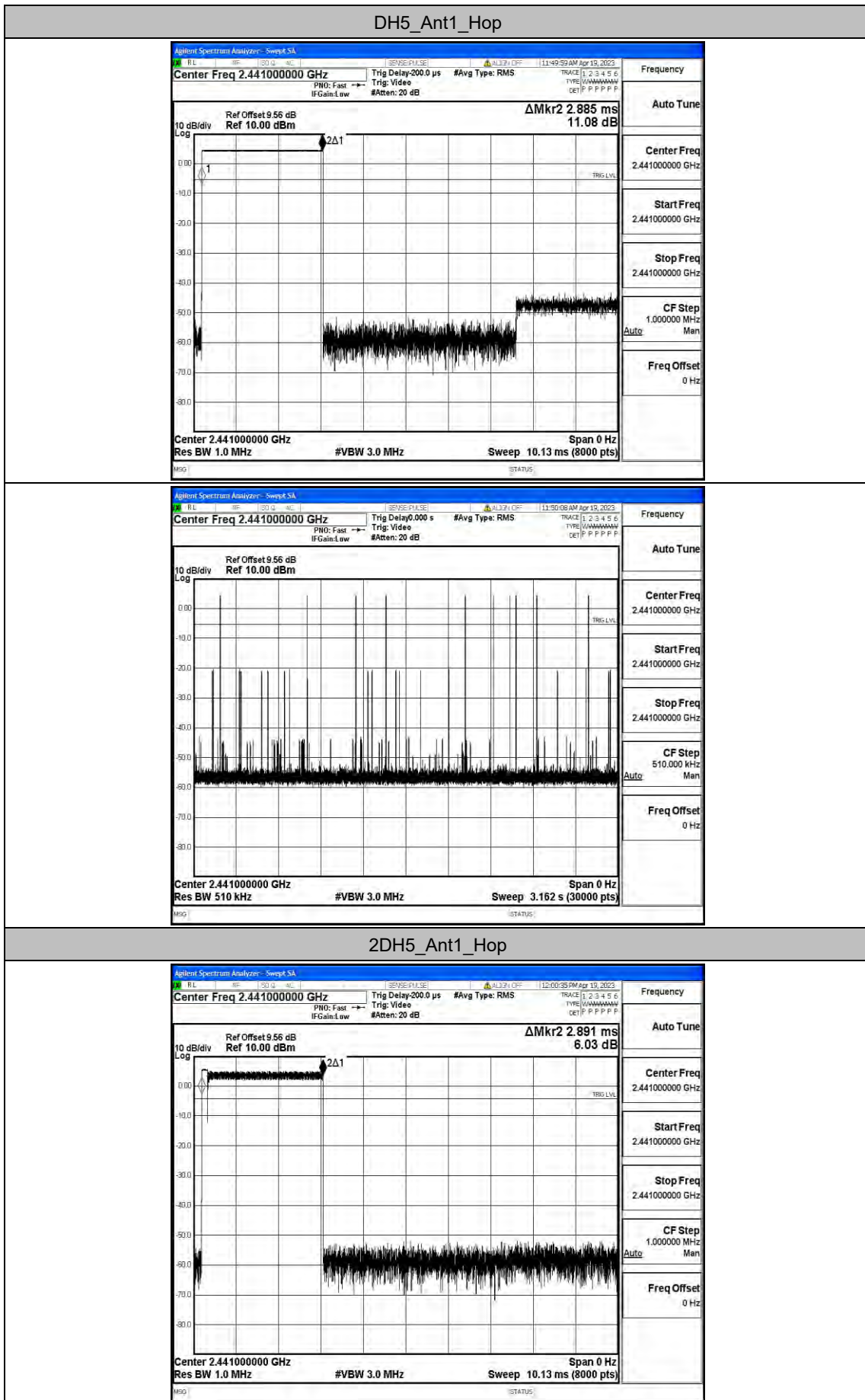


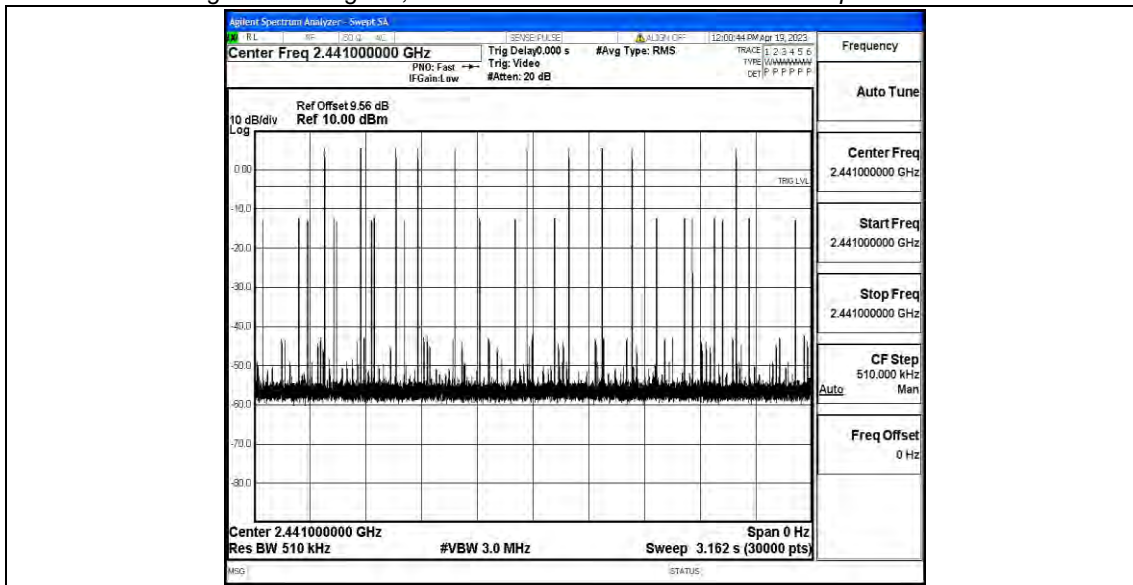
Appendix E: Time of occupancy

Test Result

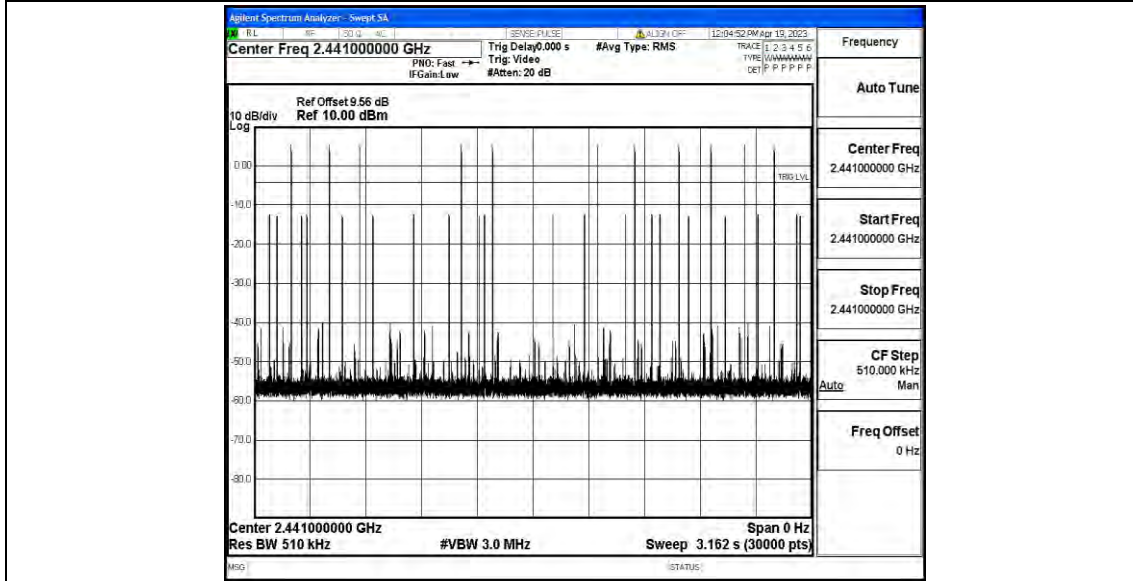
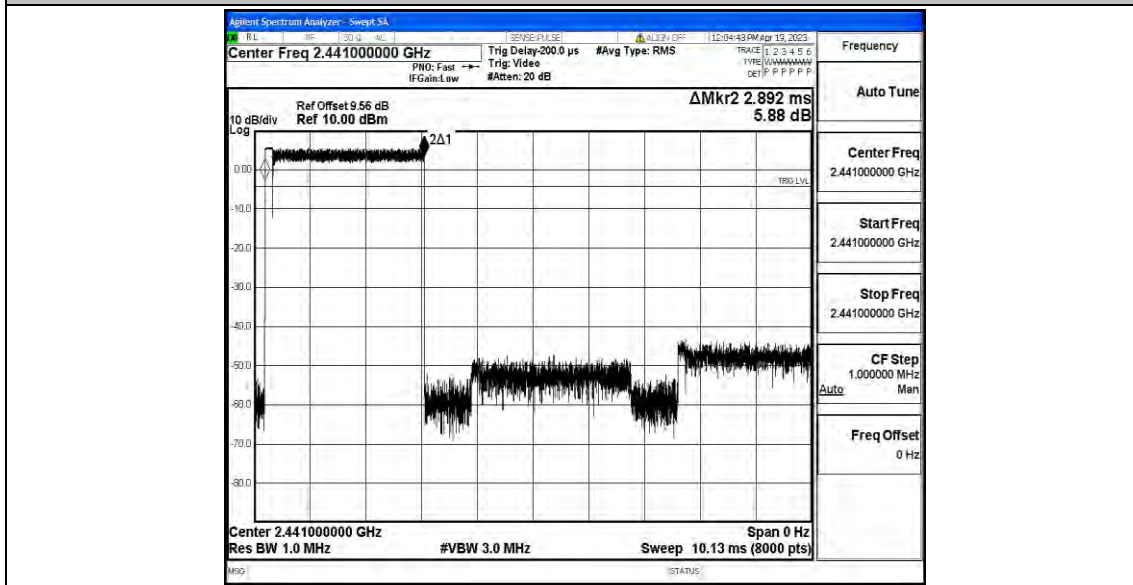
| TestMode | Antenna | Channel | BurstWidth [ms] | TotalHops [Num] | Result[s] | Limit[s] | Verdict |
|----------|---------|---------|--------------------|--------------------|-----------|----------|---------|
| DH5 | Ant1 | Hop | 2.885 | 110 | 0.317 | ≤0.4 | PASS |
| 2DH5 | Ant1 | Hop | 2.891 | 120 | 0.347 | ≤0.4 | PASS |
| 3DH5 | Ant1 | Hop | 2.892 | 120 | 0.347 | ≤0.4 | PASS |

Test Graphs





3DH5_Ant1_Hop

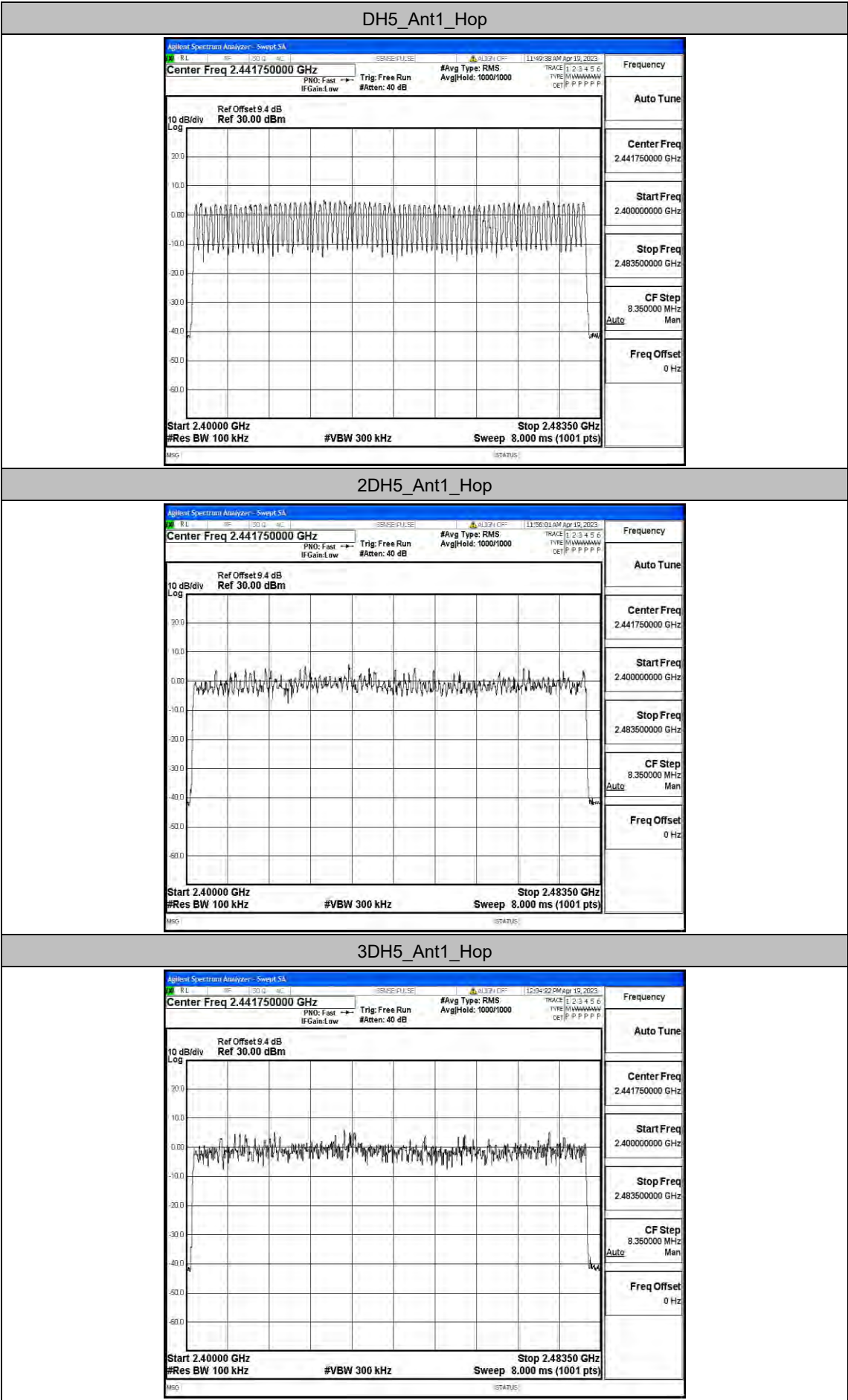


Appendix F: Number of hopping channels

Test Result

| TestMode | Antenna | Channel | Result[Num] | Limit[Num] | Verdict |
|----------|---------|---------|-------------|------------|---------|
| DH5 | Ant1 | Hop | 79 | ≥15 | PASS |
| 2DH5 | Ant1 | Hop | 79 | ≥15 | PASS |
| 3DH5 | Ant1 | Hop | 79 | ≥15 | PASS |

Test Graphs



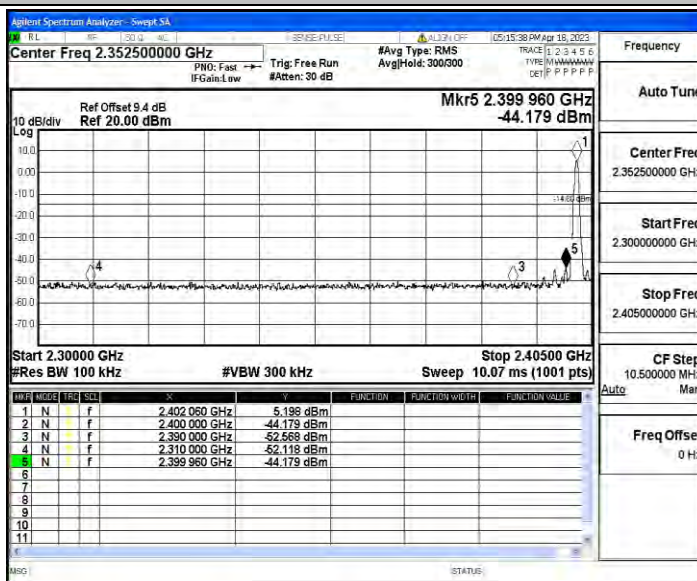
Appendix G: Band edge measurements

Test Result

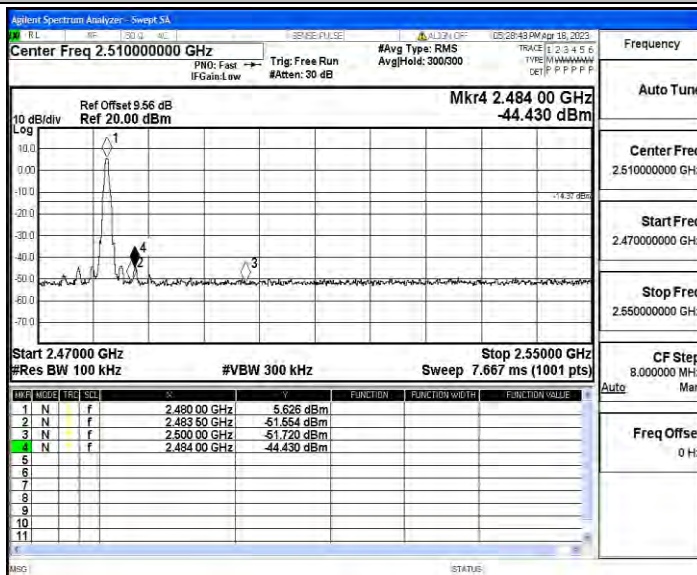
| TestMode | Antenna | ChName | Channel | RefLevel [dBm] | Result [dBm] | Limit [dBm] | Verdict |
|----------|---------|--------|----------|----------------|--------------|-------------|---------|
| DH5 | Ant1 | Low | 2402 | 5.20 | -44.18 | ≤-14.8 | PASS |
| | | High | 2480 | 5.63 | -44.43 | ≤-14.37 | PASS |
| | | Low | Hop_2402 | 3.56 | -50.04 | ≤-16.44 | PASS |
| | | High | Hop_2480 | 4.57 | -48.78 | ≤-15.43 | PASS |
| 2DH5 | Ant1 | Low | 2402 | 4.22 | -46.22 | ≤-15.78 | PASS |
| | | High | 2480 | 4.96 | -44.83 | ≤-15.04 | PASS |
| | | Low | Hop_2402 | 0.41 | -49.94 | ≤-19.59 | PASS |
| | | High | Hop_2480 | 2.47 | -48.27 | ≤-17.53 | PASS |
| 3DH5 | Ant1 | Low | 2402 | 4.02 | -45.8 | ≤-15.99 | PASS |
| | | High | 2480 | 5.69 | -44.72 | ≤-14.31 | PASS |
| | | Low | Hop_2402 | 4.27 | -49.99 | ≤-15.73 | PASS |
| | | High | Hop_2480 | 5.93 | -47.47 | ≤-14.08 | PASS |

Test Graphs

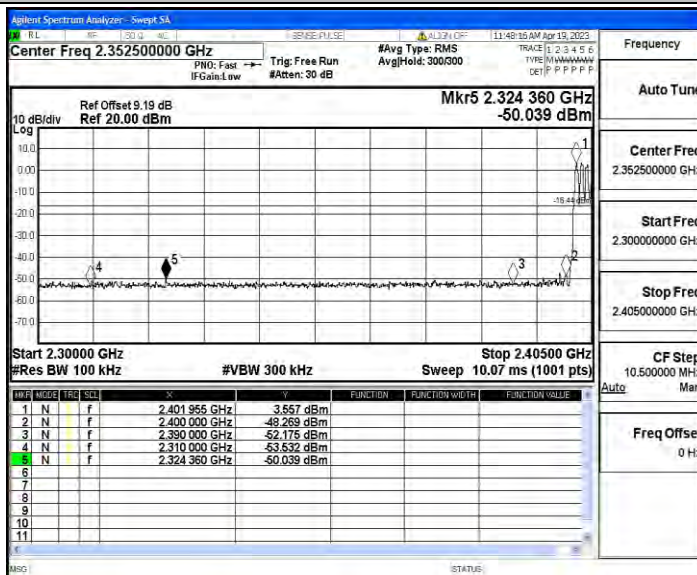
DH5_Ant1_Low_2402



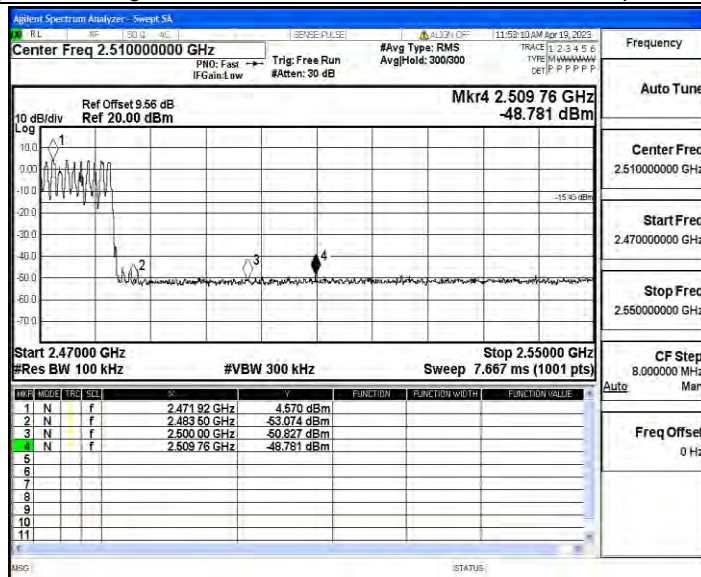
DH5_Ant1_High_2480



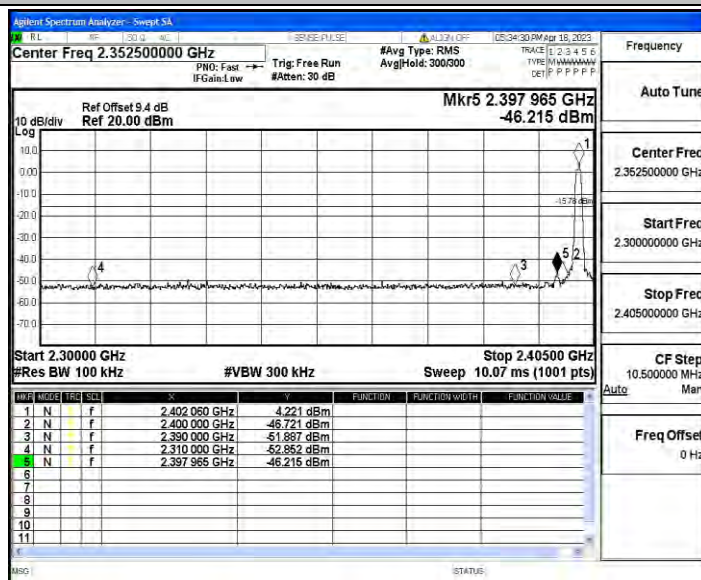
DH5_Ant1_Low_Hop_2402



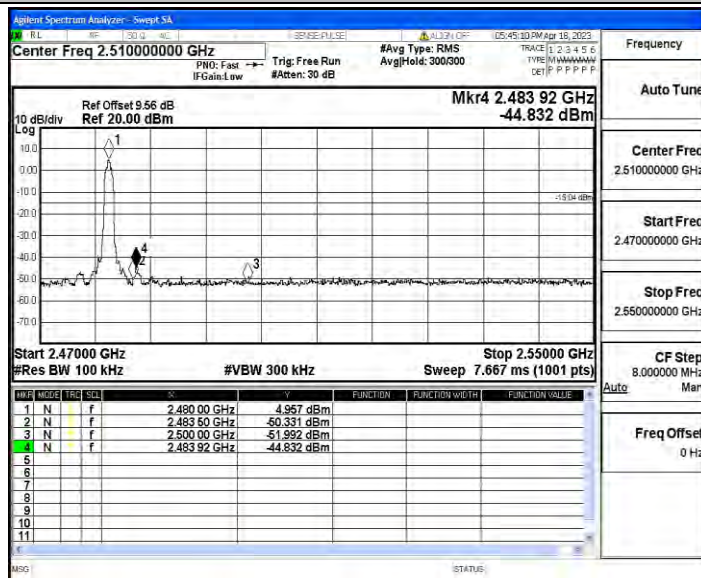
DH5_Ant1_High_Hop_2480



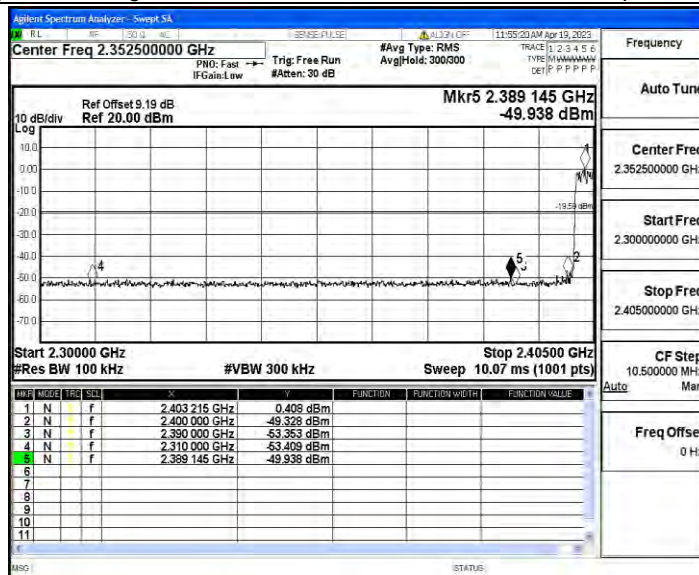
2DH5_Ant1_Low_2402



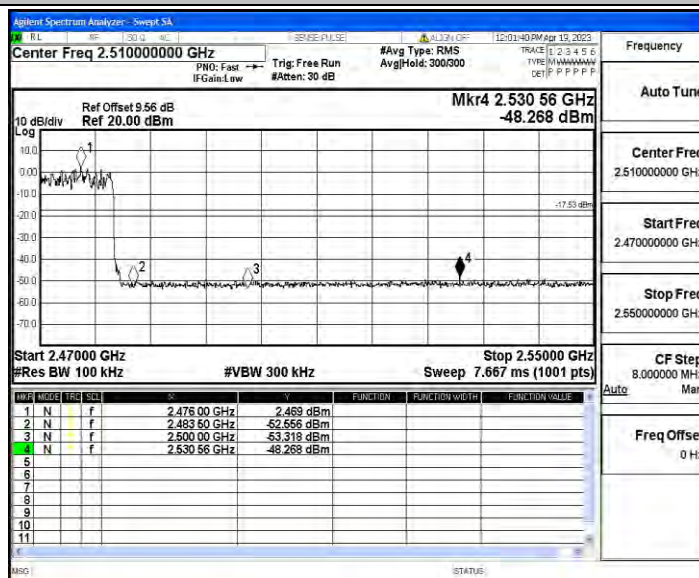
2DH5_Ant1_High_2480



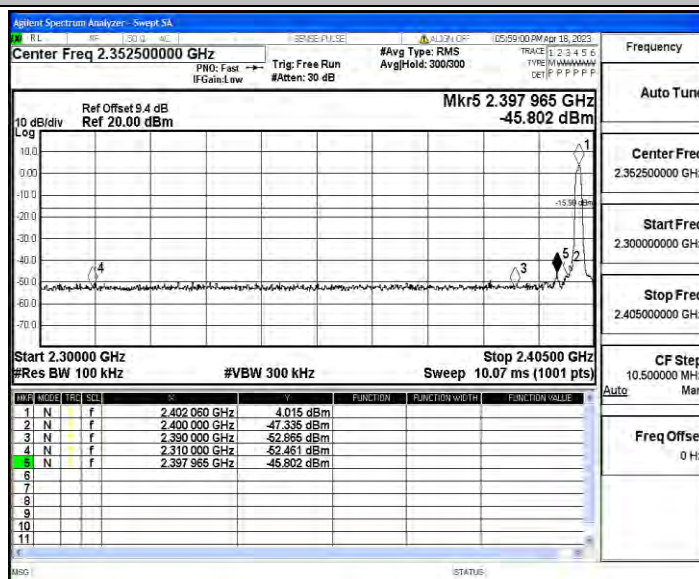
2DH5_Ant1_Low_Hop_2402



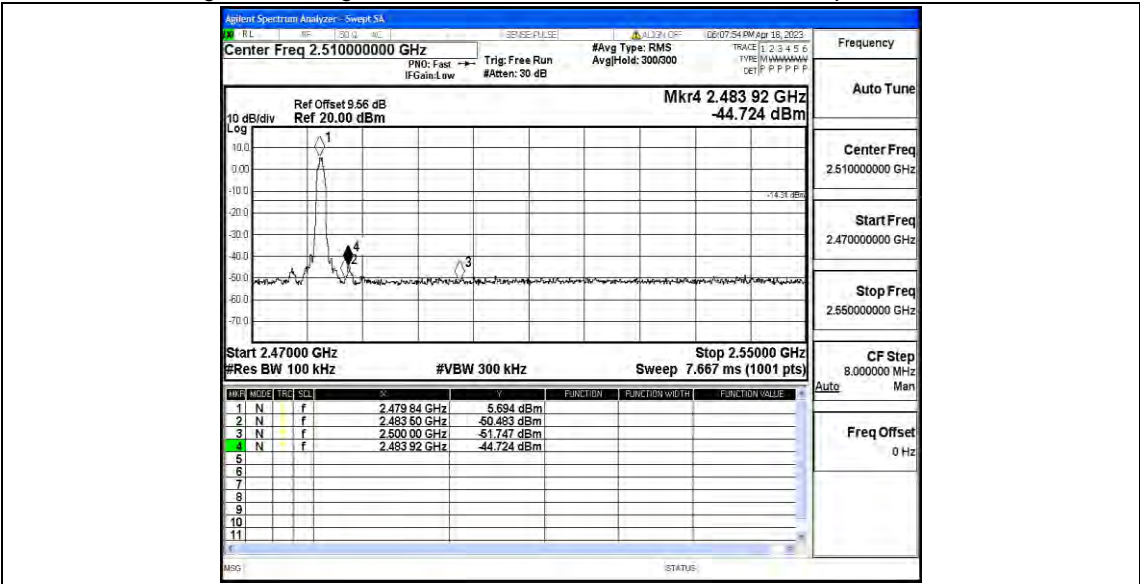
2DH5_Ant1_High_Hop_2480



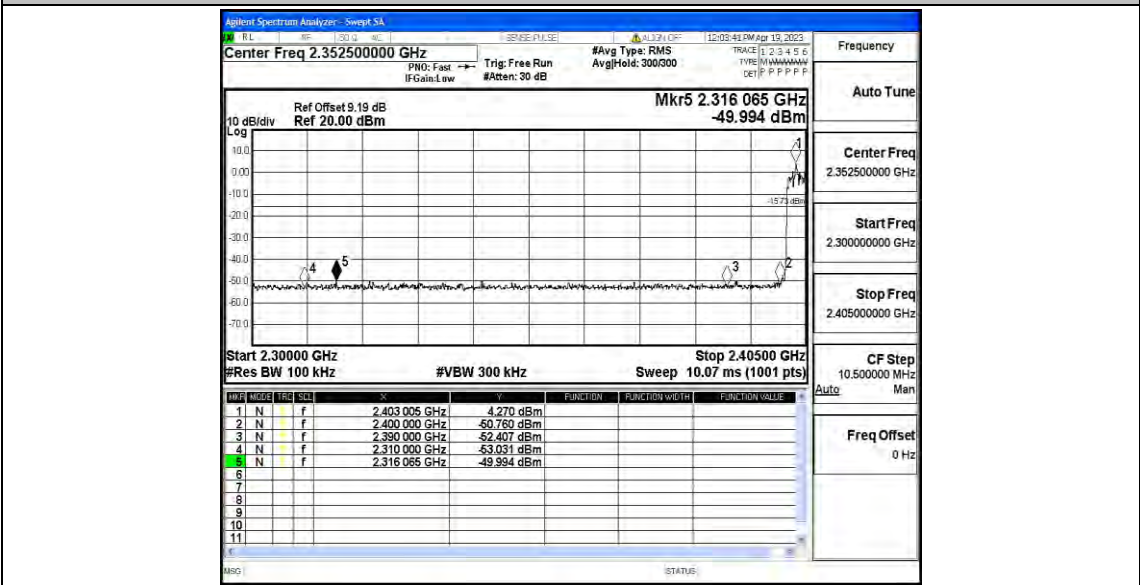
3DH5_Ant1_Low_2402



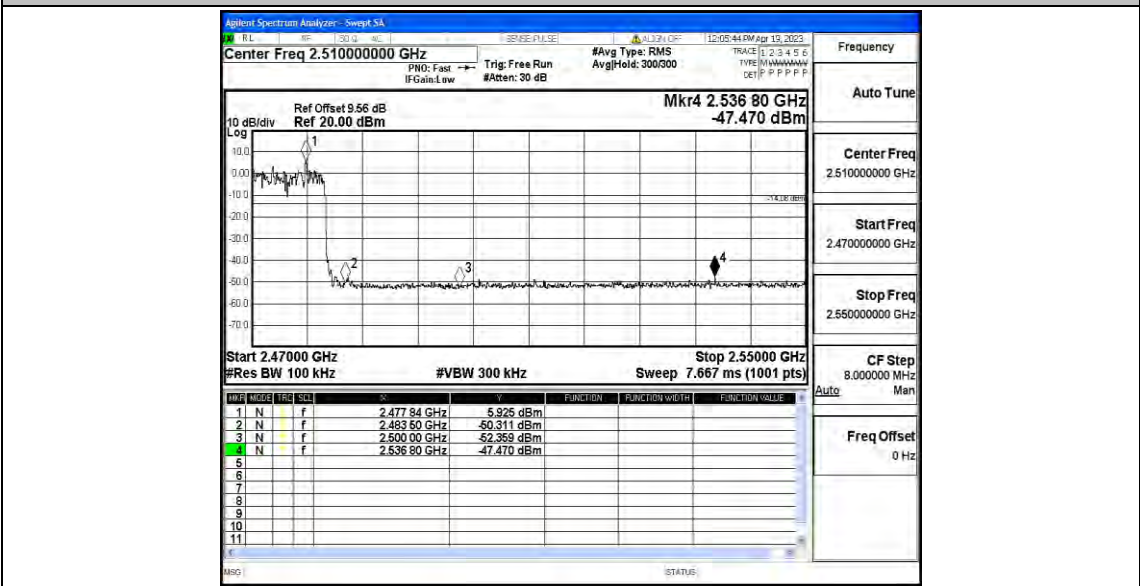
3DH5_Ant1_High_2480



3DH5_Ant1_Low_Hop_2402



3DH5_Ant1_High_Hop_2480

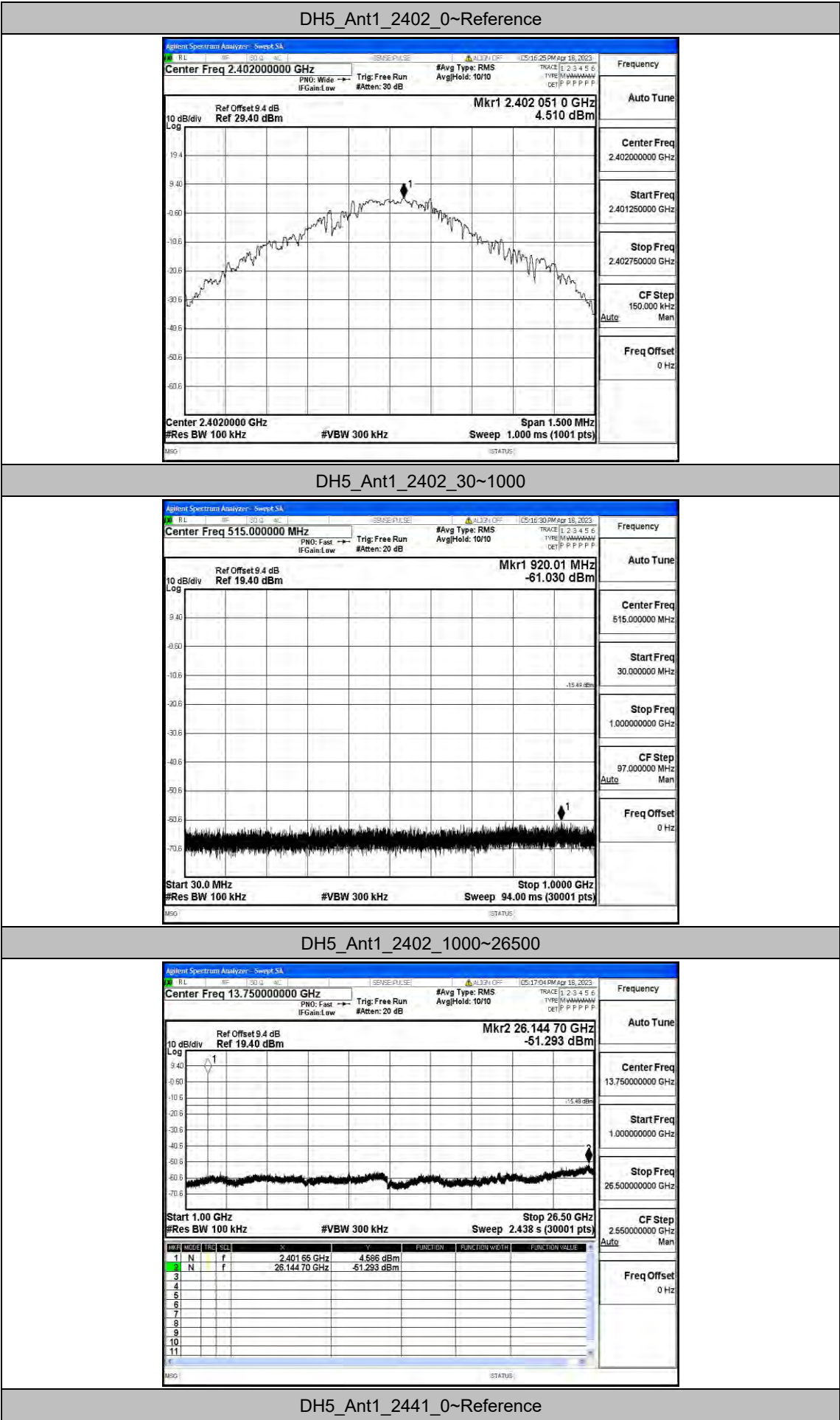


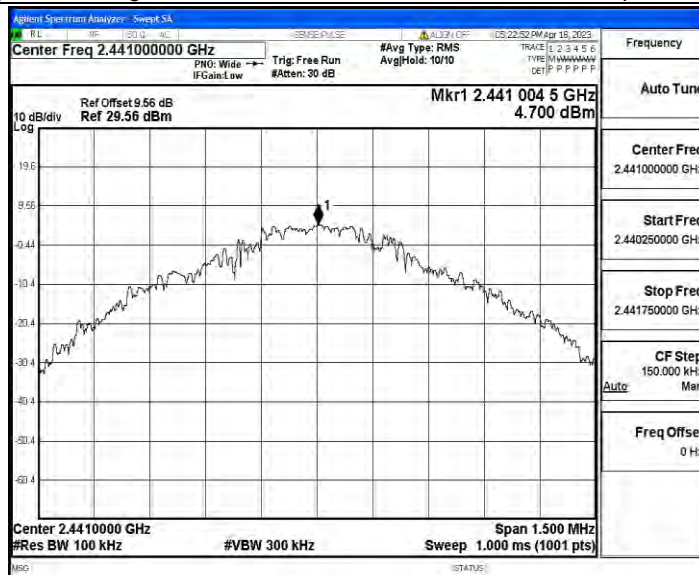
Appendix H: Conducted Spurious Emission

Test Result

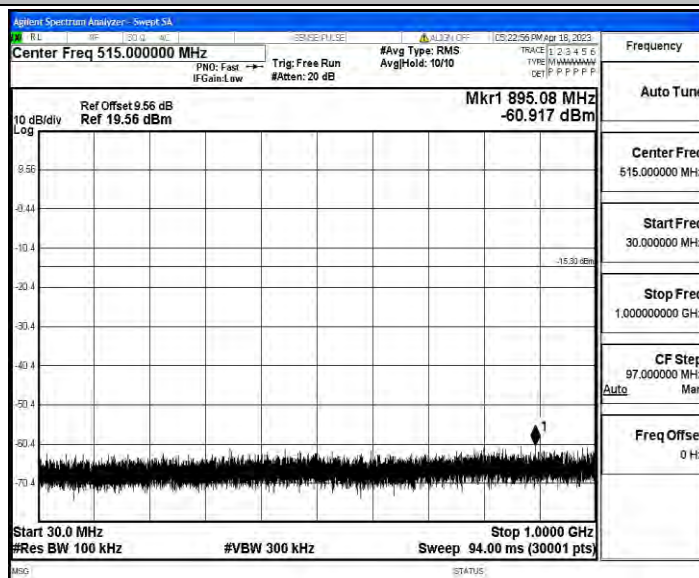
| TestMode | Antenna | Channel | FreqRange [MHz] | RefLevel [dBm] | Result [dBm] | Limit [dBm] | Verdict |
|----------|---------|---------|-----------------|----------------|--------------|-------------|---------|
| DH5 | Ant1 | 2402 | Reference | 4.51 | 4.51 | --- | PASS |
| | | | 30~1000 | 4.51 | -61.03 | ≤-15.49 | PASS |
| | | | 1000~26500 | 4.51 | -51.29 | ≤-15.49 | PASS |
| | | 2441 | Reference | 4.70 | 4.70 | --- | PASS |
| | | | 30~1000 | 4.70 | -60.92 | ≤-15.3 | PASS |
| | | | 1000~26500 | 4.70 | -51.14 | ≤-15.3 | PASS |
| | | 2480 | Reference | 5.03 | 5.03 | --- | PASS |
| | | | 30~1000 | 5.03 | -61.05 | ≤-14.97 | PASS |
| | | | 1000~26500 | 5.03 | -51.58 | ≤-14.97 | PASS |
| 2DH5 | Ant1 | 2402 | Reference | 1.21 | 1.21 | --- | PASS |
| | | | 30~1000 | 1.21 | -60.27 | ≤-18.79 | PASS |
| | | | 1000~26500 | 1.21 | -52.33 | ≤-18.79 | PASS |
| | | 2441 | Reference | 5.18 | 5.18 | --- | PASS |
| | | | 30~1000 | 5.18 | -59.58 | ≤-14.82 | PASS |
| | | | 1000~26500 | 5.18 | -52.06 | ≤-14.82 | PASS |
| | | 2480 | Reference | 0.57 | 0.57 | --- | PASS |
| | | | 30~1000 | 0.57 | -60.3 | ≤-19.43 | PASS |
| | | | 1000~26500 | 0.57 | -52.01 | ≤-19.43 | PASS |
| 3DH5 | Ant1 | 2402 | Reference | 1.24 | 1.24 | --- | PASS |
| | | | 30~1000 | 1.24 | -60.96 | ≤-18.76 | PASS |
| | | | 1000~26500 | 1.24 | -51.83 | ≤-18.76 | PASS |
| | | 2441 | Reference | 4.26 | 4.26 | --- | PASS |
| | | | 30~1000 | 4.26 | -61.14 | ≤-15.74 | PASS |
| | | | 1000~26500 | 4.26 | -52.16 | ≤-15.74 | PASS |
| | | 2480 | Reference | 4.75 | 4.75 | --- | PASS |
| | | | 30~1000 | 4.75 | -61.04 | ≤-15.25 | PASS |
| | | | 1000~26500 | 4.75 | -51.08 | ≤-15.25 | PASS |

Test Graphs

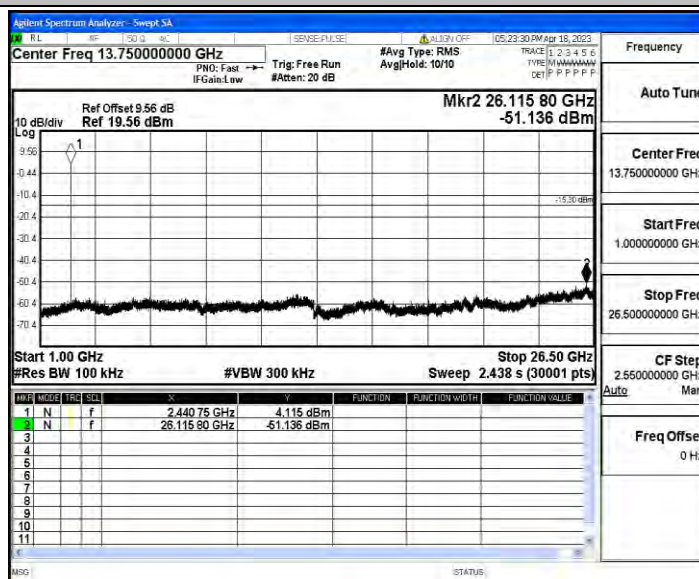




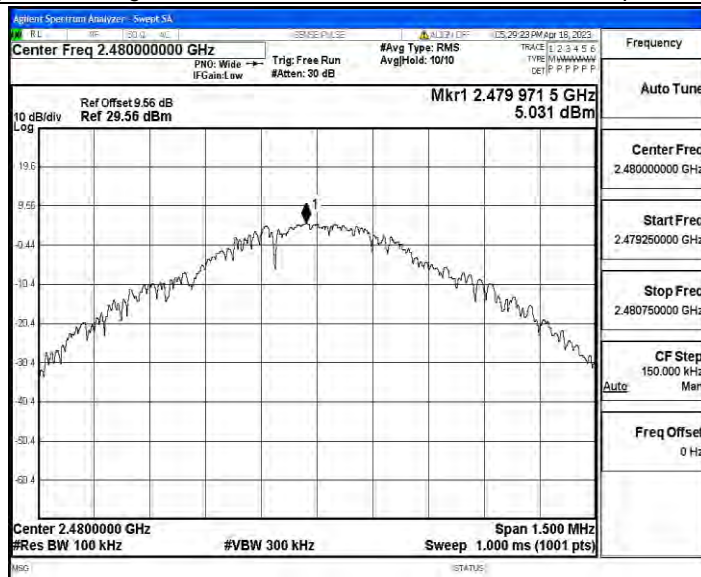
DH5_Ant1_2441_30~1000



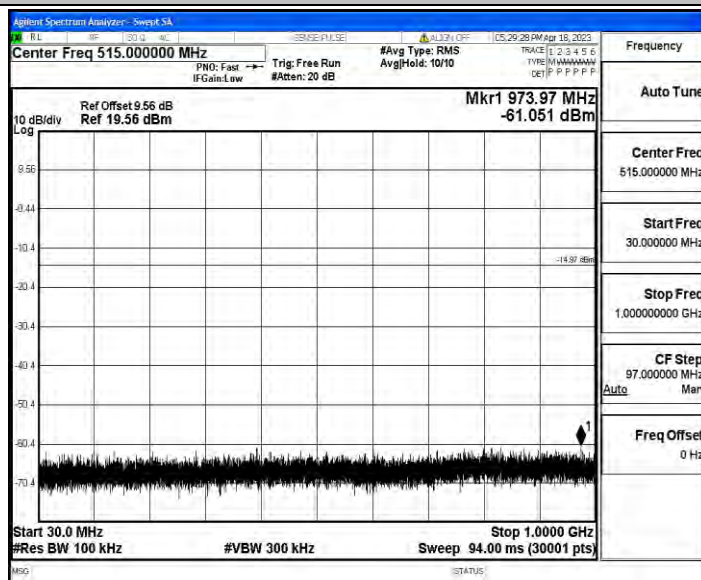
DH5_Ant1_2441_1000~26500



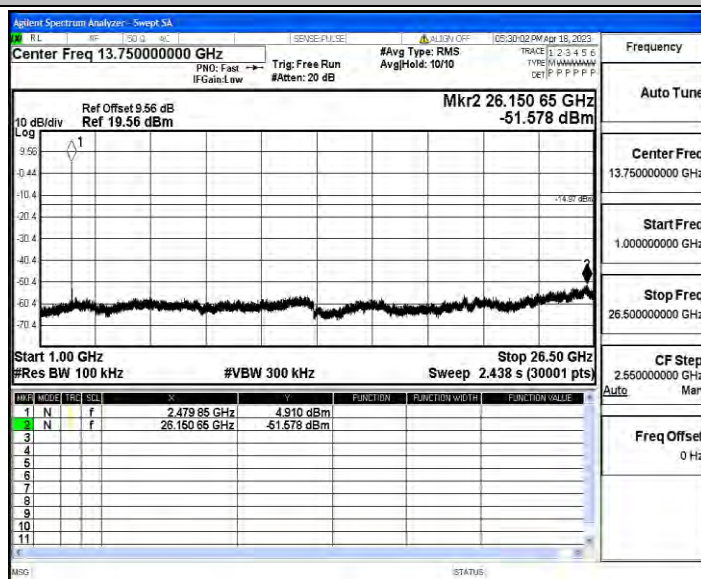
DH5_Ant1_2480_0~Reference



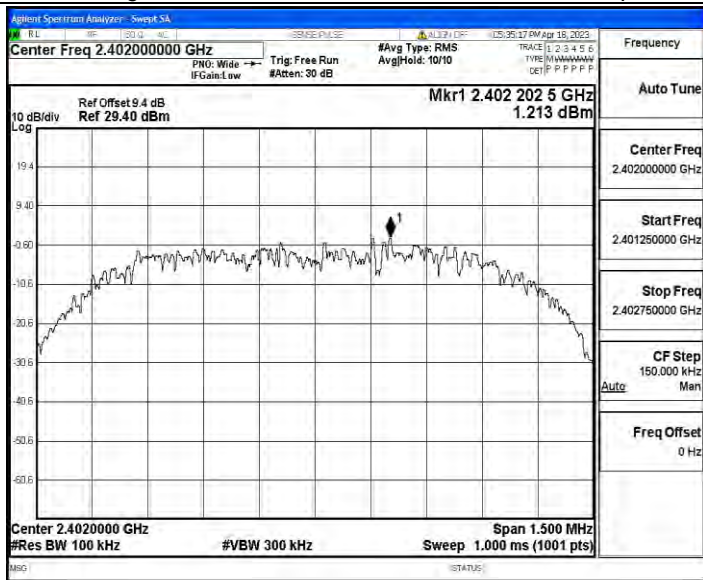
DH5_Ant1_2480_30~1000



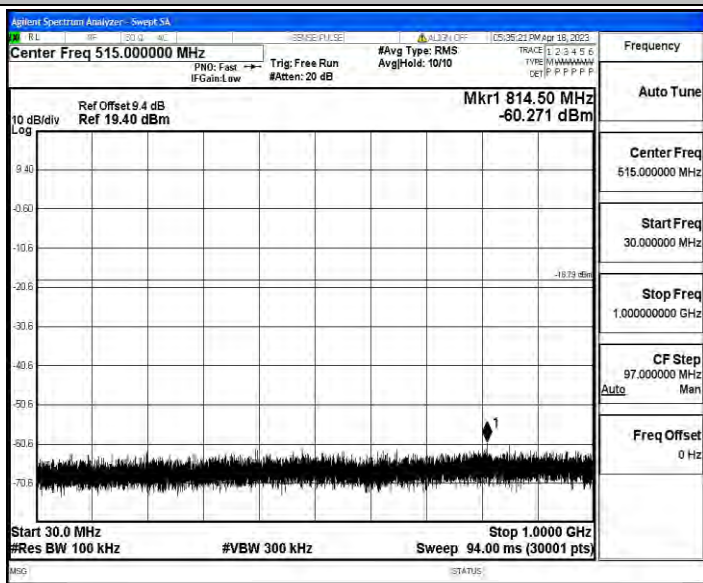
DH5_Ant1_2480_1000~26500



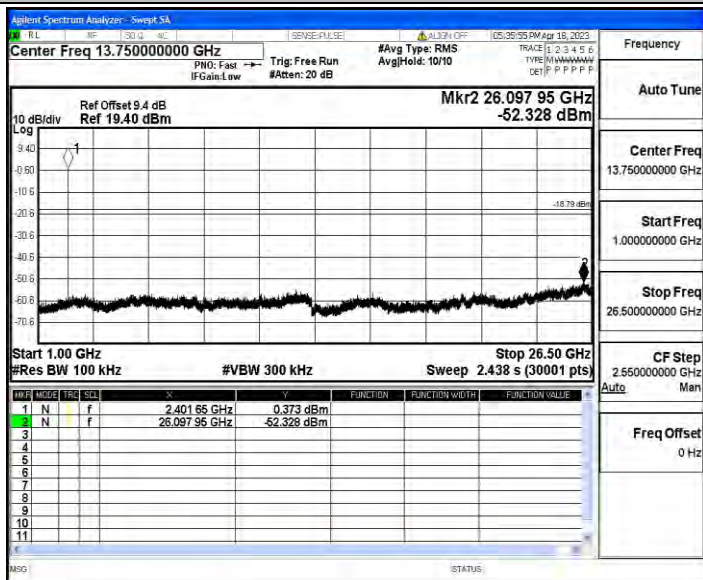
2DH5_Ant1_2402_0~Reference



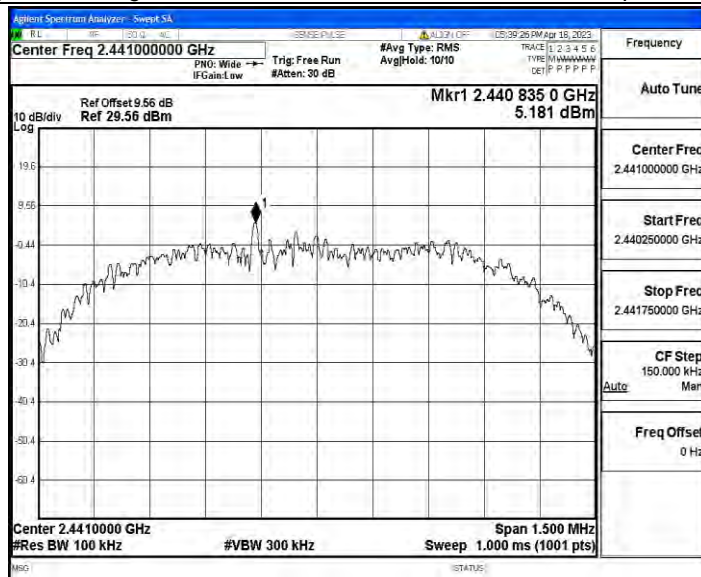
2DH5_Ant1_2402_30~1000



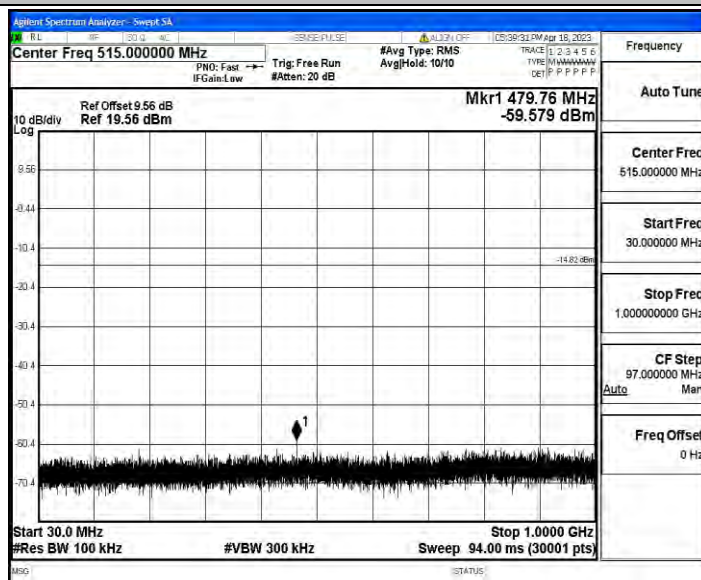
2DH5_Ant1_2402_1000~26500



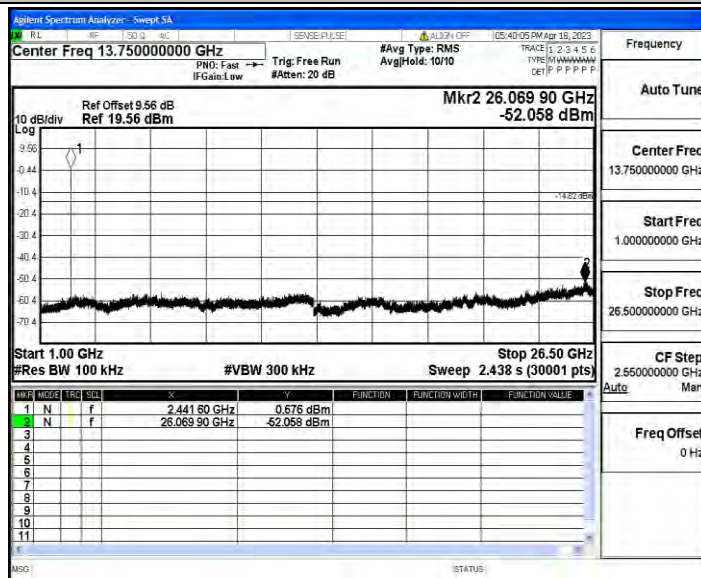
2DH5_Ant1_2441_0~Reference



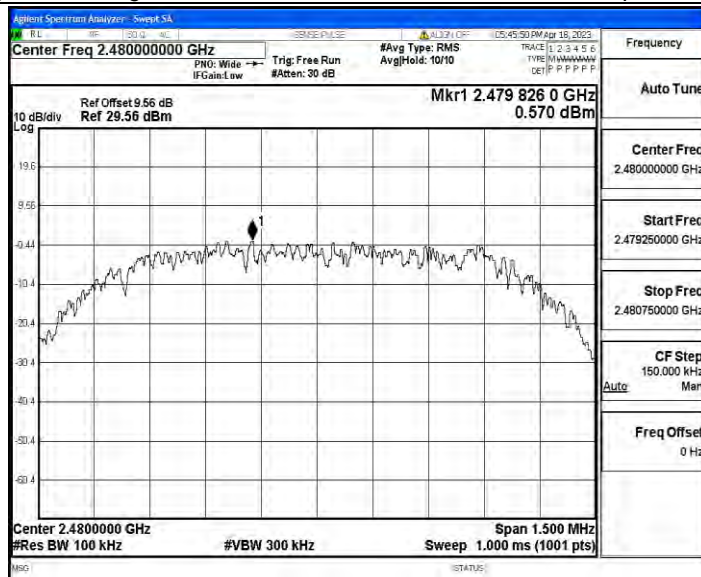
2DH5_Ant1_2441_30~1000



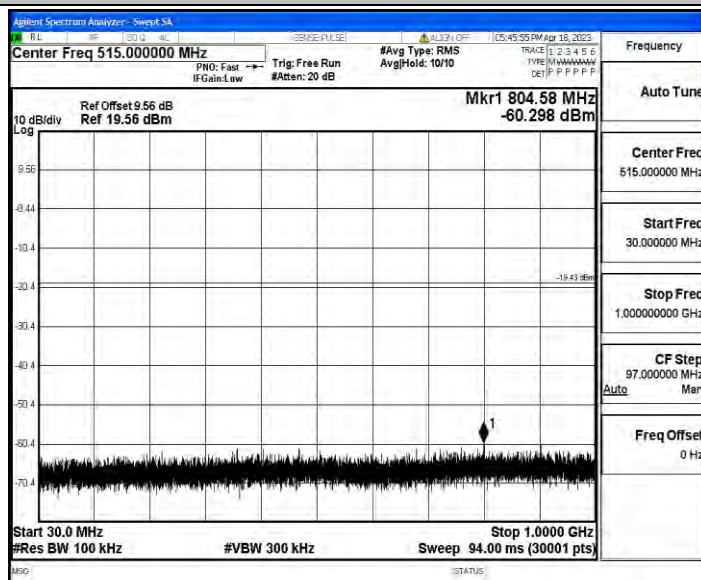
2DH5_Ant1_2441_1000~26500



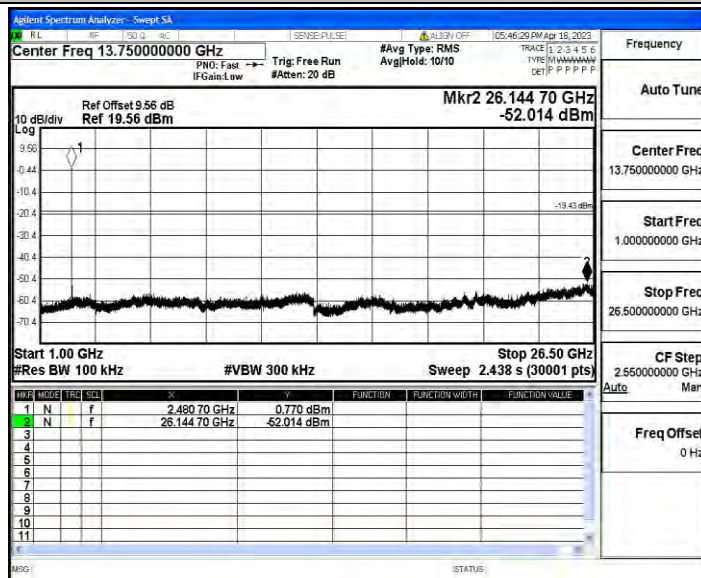
2DH5_Ant1_2480_0~Reference



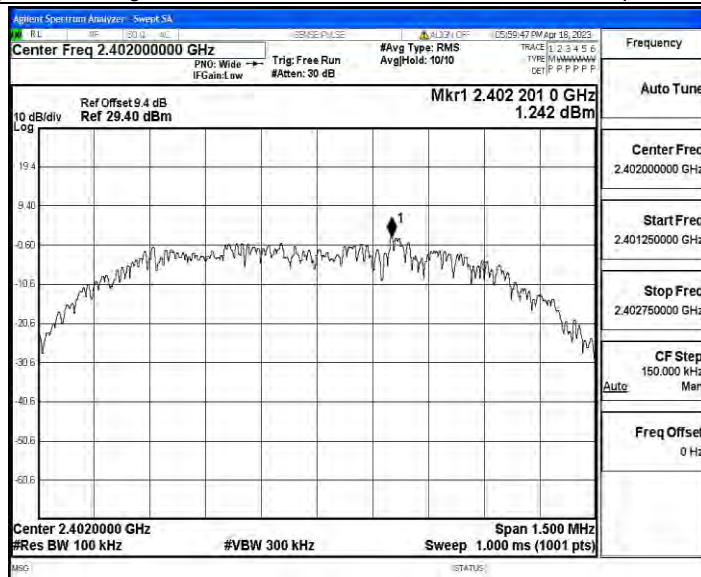
2DH5_Ant1_2480_30~1000



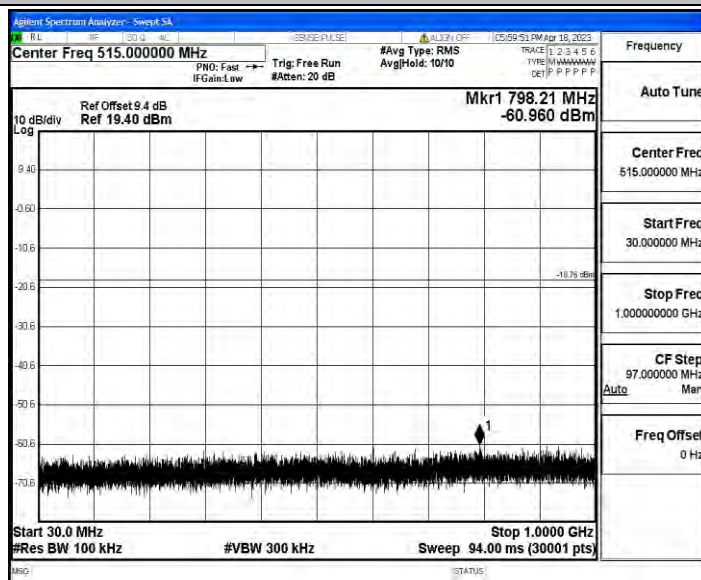
2DH5_Ant1_2480_1000~26500



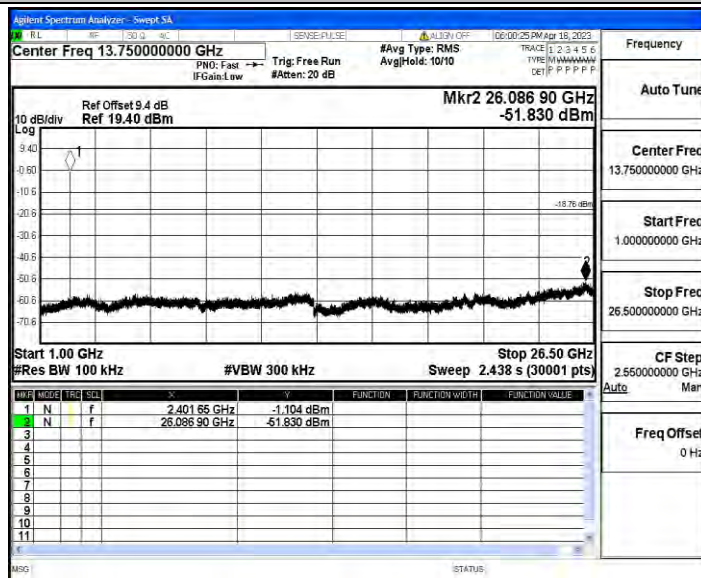
3DH5_Ant1_2402_0~Reference



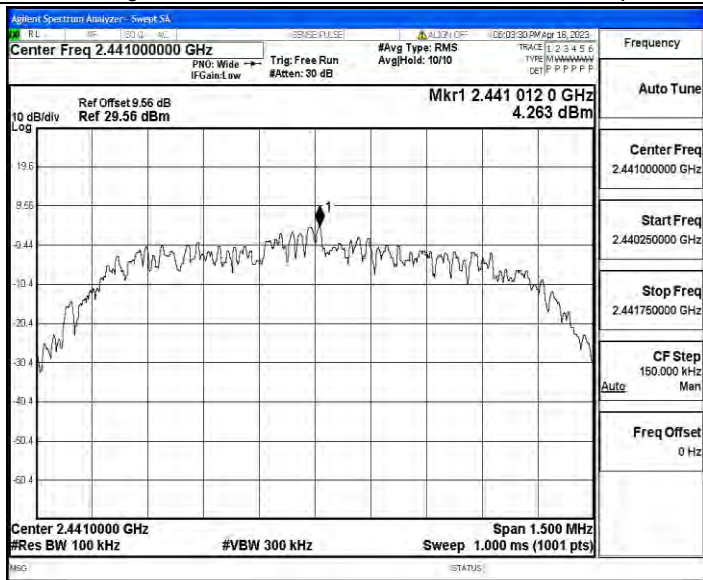
3DH5_Ant1_2402_30~1000



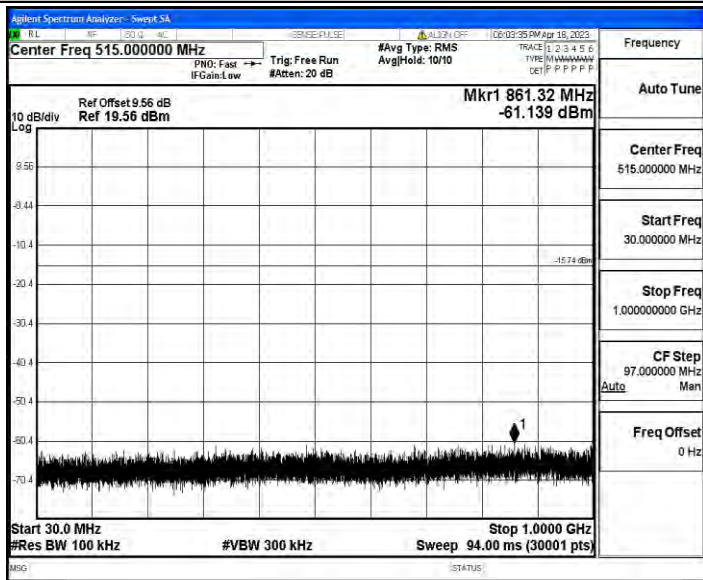
3DH5_Ant1_2402_1000~26500



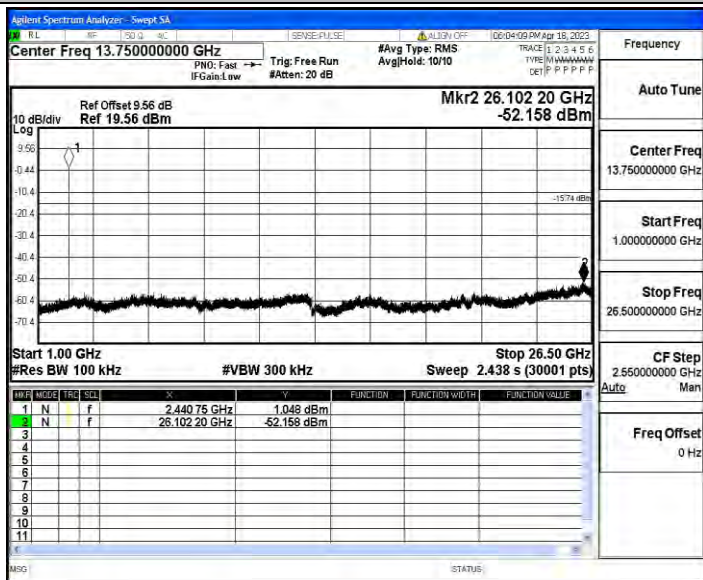
3DH5_Ant1_2441_0~Reference



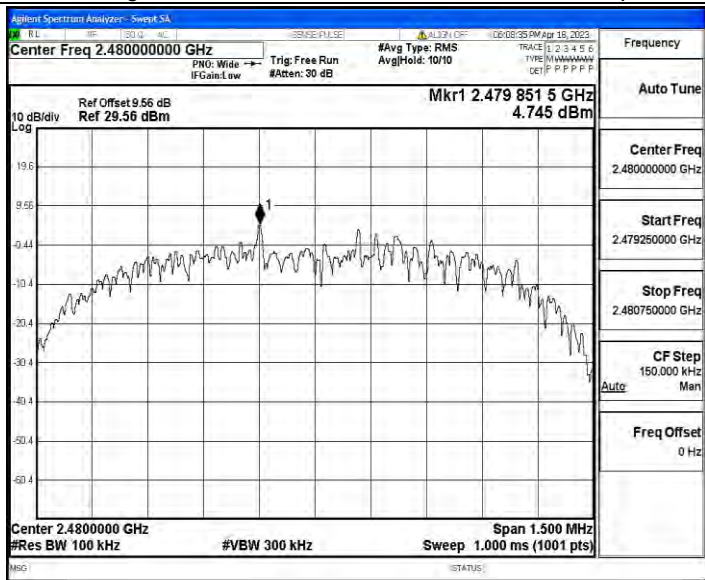
3DH5_Ant1_2441_30~1000



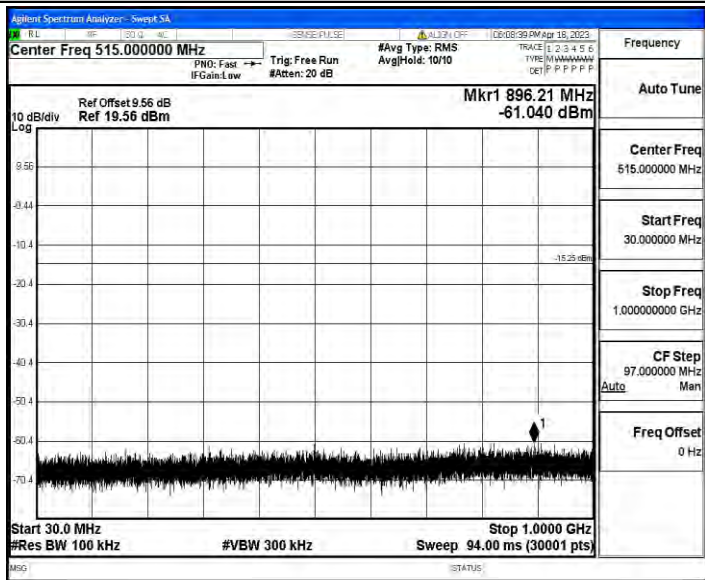
3DH5_Ant1_2441_1000~26500



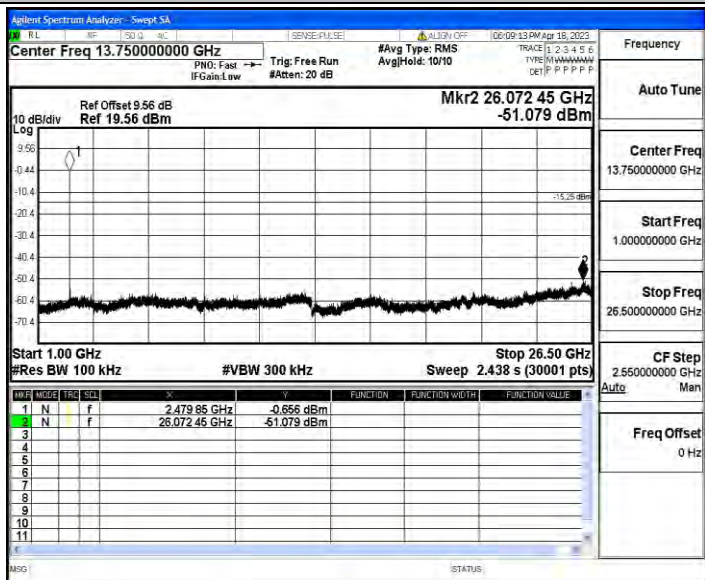
3DH5_Ant1_2480_0~Reference



3DH5_Ant1_2480_30~1000



3DH5_Ant1_2480_1000~26500

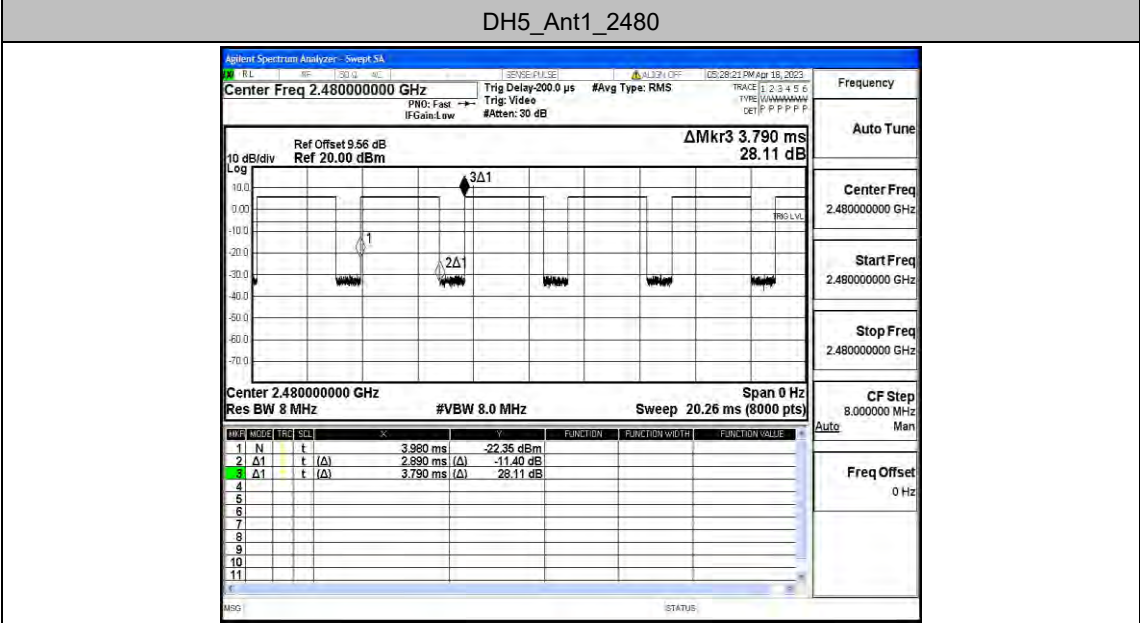
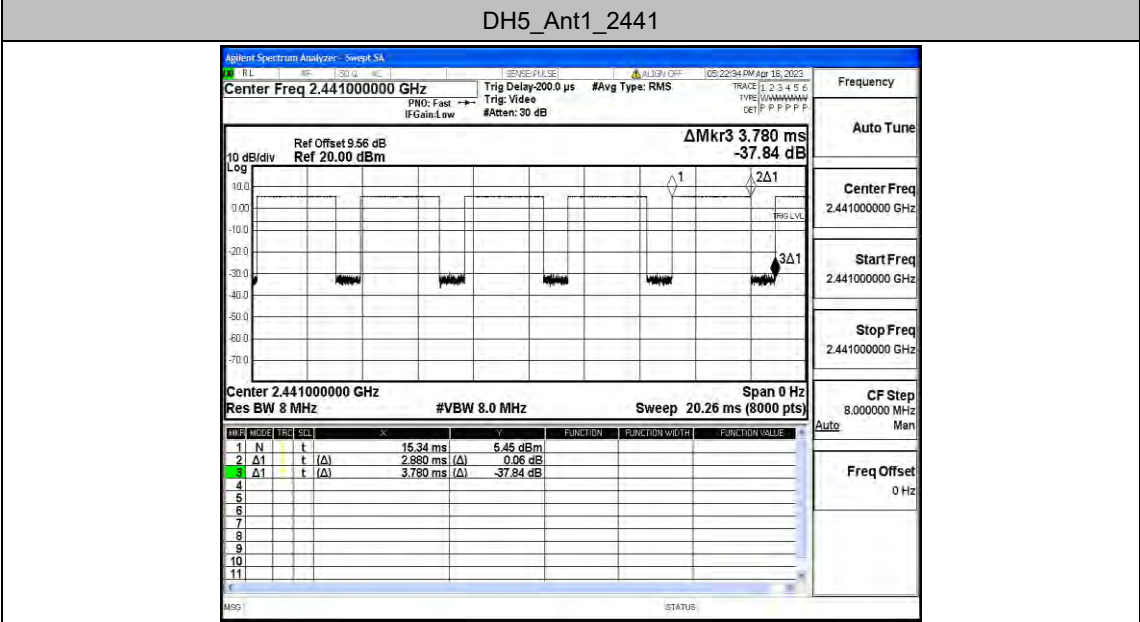
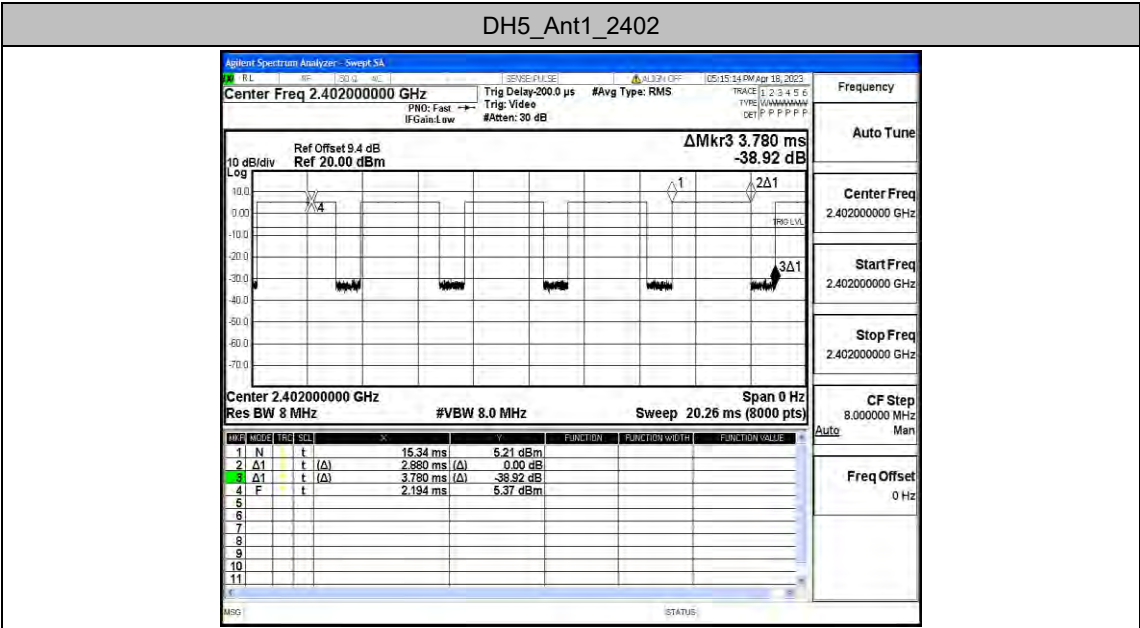


Appendix I: Duty Cycle

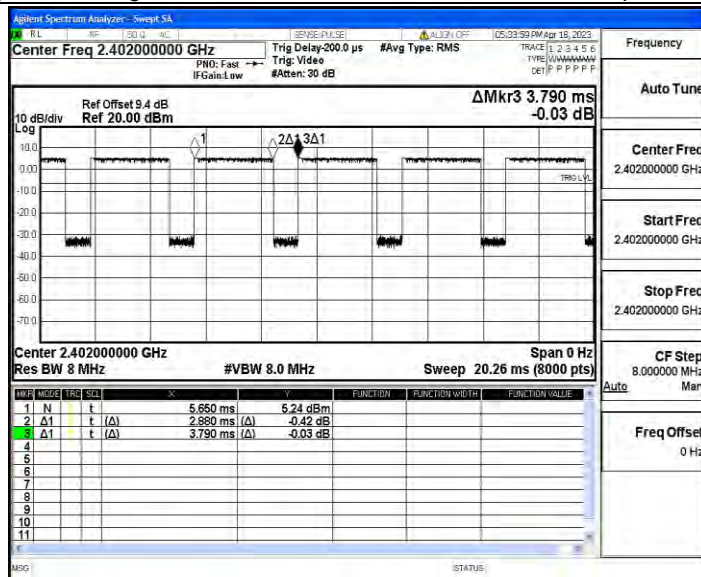
Test Result

| TestMode | Antenna | Channel | Transmission Duration [ms] | Transmission Period [ms] | Duty Cycle [%] | 1/T[kHz] |
|----------|---------|---------|----------------------------|--------------------------|----------------|----------|
| DH5 | Ant1 | 2402 | 2.88 | 3.78 | 76.19 | 0.35 |
| | | 2441 | 2.88 | 3.78 | 76.19 | 0.35 |
| | | 2480 | 2.89 | 3.79 | 76.25 | 0.35 |
| 2DH5 | Ant1 | 2402 | 2.88 | 3.79 | 75.99 | 0.35 |
| | | 2441 | 2.88 | 3.79 | 75.99 | 0.35 |
| | | 2480 | 2.89 | 3.79 | 76.25 | 0.35 |
| 3DH5 | Ant1 | 2402 | 2.88 | 3.79 | 75.99 | 0.35 |
| | | 2441 | 2.88 | 3.79 | 75.99 | 0.35 |
| | | 2480 | 2.89 | 3.80 | 76.05 | 0.35 |

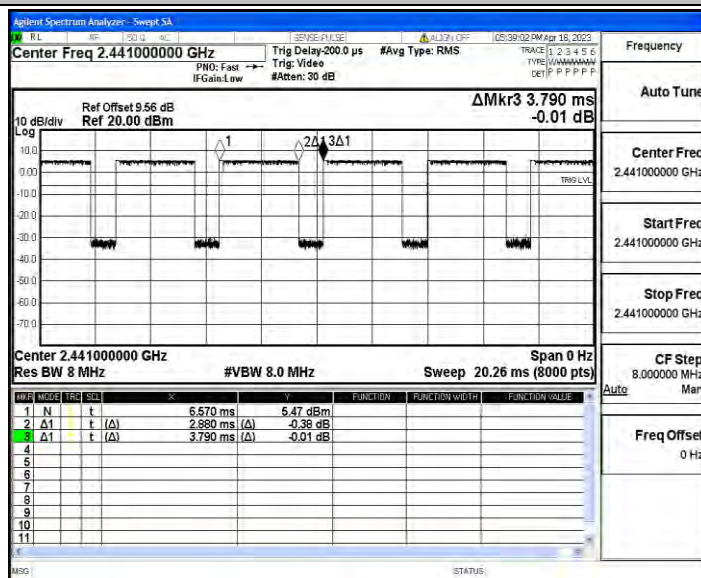
Test Graphs



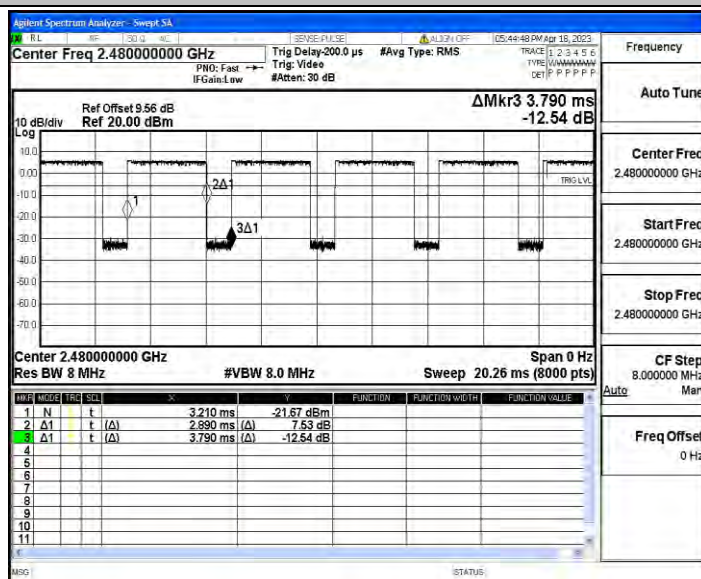
2DH5_Ant1_2402



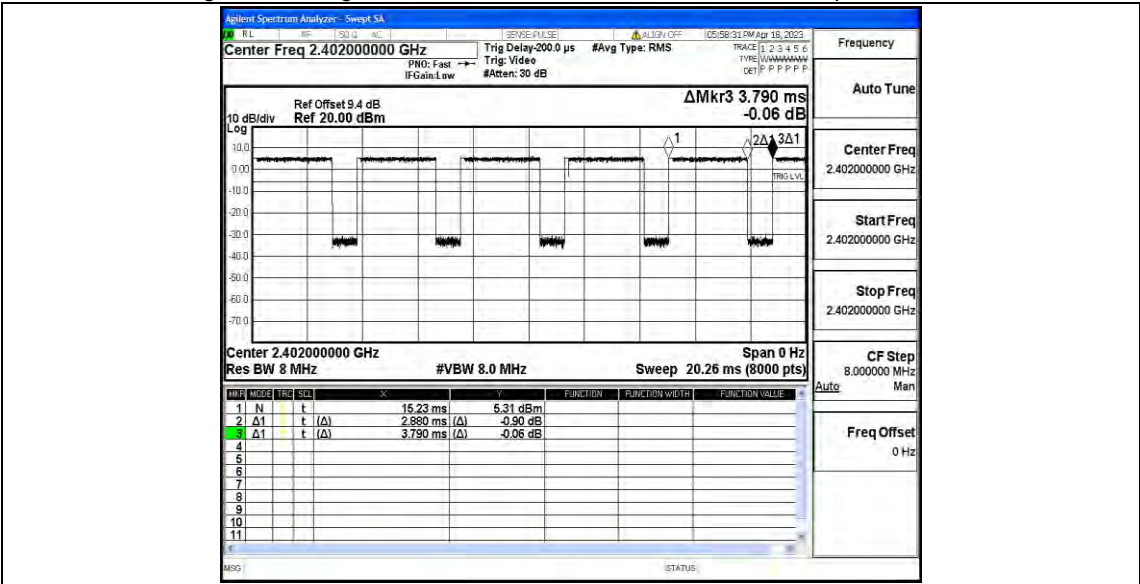
2DH5_Ant1_2441



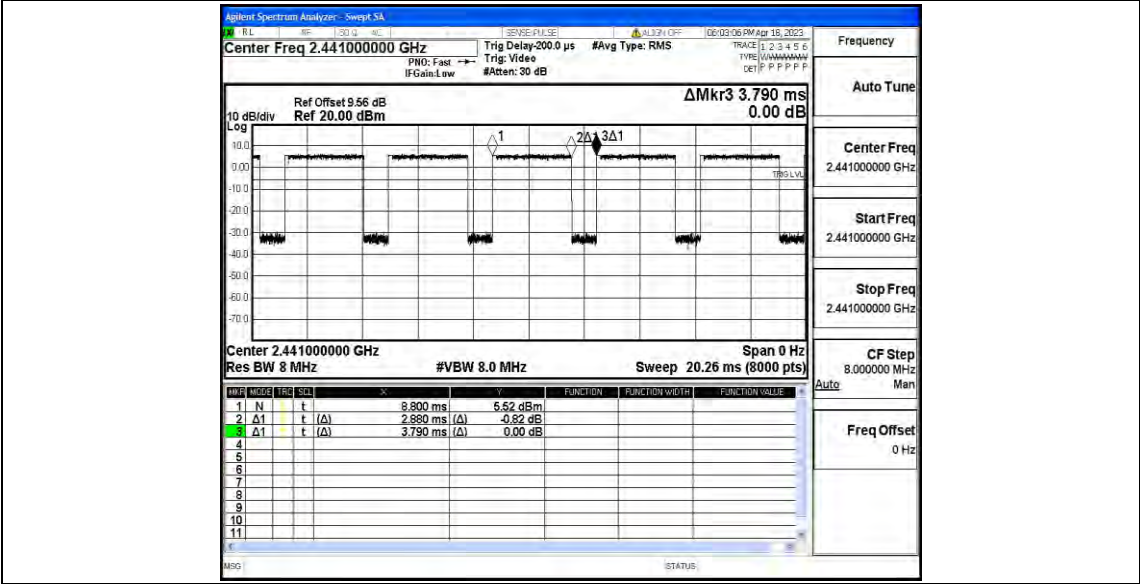
2DH5_Ant1_2480



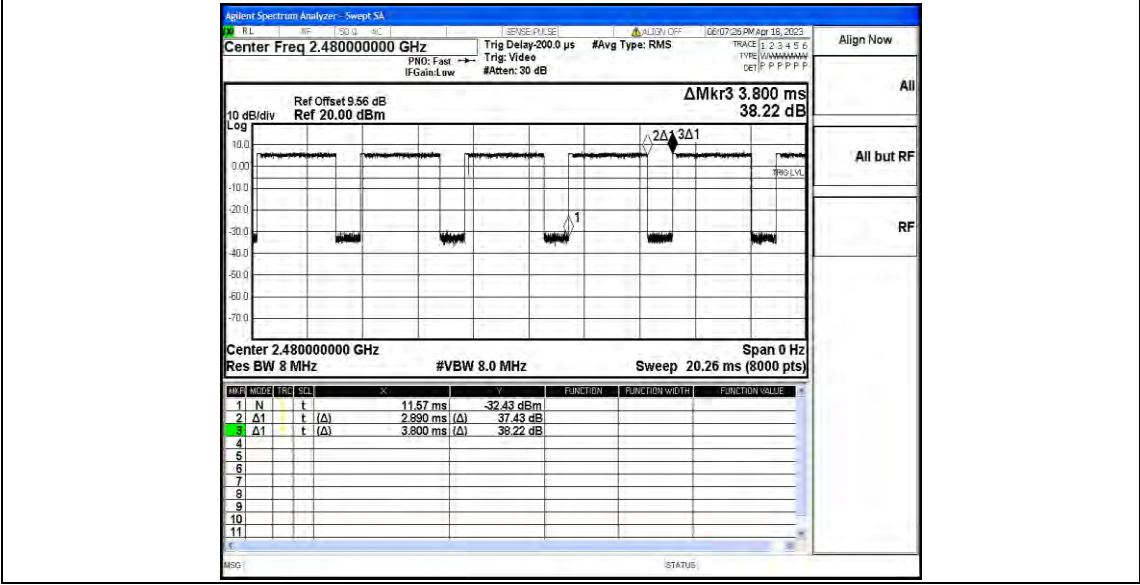
3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480



Appendix J: Emissions in Restricted Bands

Test Result

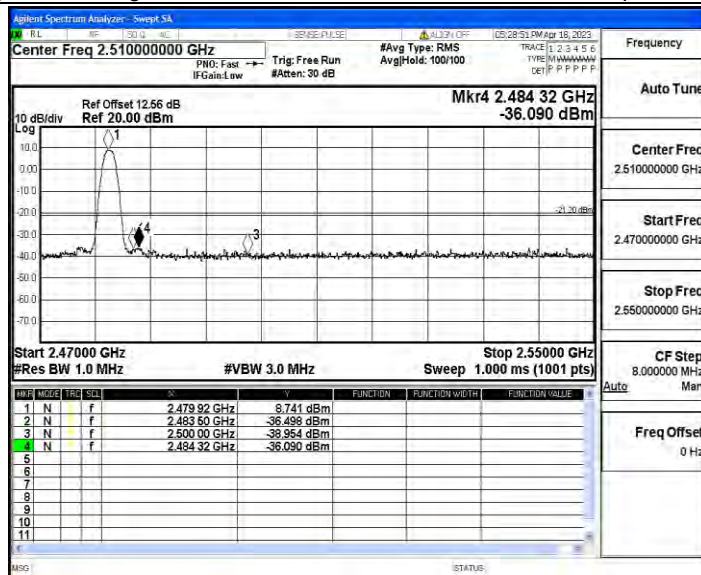
| TestMode | Antenna | ChName | Channel | Detector | Freq(MHz) | Result(dBm) | Limit(dBm) | Verdict |
|----------|---------|--------|---------|----------|-----------|-------------|------------|---------|
| DH5 | Ant1 | Low | 2402 | AV | 2310.000 | -48.01 | ≤-41.20 | PASS |
| | | | | AV | 2383.685 | -47.52 | ≤-41.20 | PASS |
| | | | | AV | 2390.000 | -47.61 | ≤-41.20 | PASS |
| | | | | Peak | 2310.000 | -39.52 | ≤-21.20 | PASS |
| | | | | Peak | 2358.170 | -37.61 | ≤-21.20 | PASS |
| | | | | Peak | 2390.000 | -38.26 | ≤-21.20 | PASS |
| | | High | 2480 | AV | 2483.500 | -43.14 | ≤-41.20 | PASS |
| | | | | AV | 2484.080 | -41.46 | ≤-41.20 | PASS |
| | | | | AV | 2500.000 | -46.95 | ≤-41.20 | PASS |
| | | | | Peak | 2483.500 | -36.5 | ≤-21.20 | PASS |
| | | | | Peak | 2484.320 | -36.09 | ≤-21.20 | PASS |
| | | | | Peak | 2500.000 | -38.95 | ≤-21.20 | PASS |
| 2DH5 | Ant1 | Low | 2402 | AV | 2310.000 | -48.04 | ≤-41.20 | PASS |
| | | | | AV | 2389.040 | -47.59 | ≤-41.20 | PASS |
| | | | | AV | 2390.000 | -47.66 | ≤-41.20 | PASS |
| | | | | Peak | 2310.000 | -41.65 | ≤-21.20 | PASS |
| | | | | Peak | 2381.585 | -37.54 | ≤-21.20 | PASS |
| | | | | Peak | 2390.000 | -40.38 | ≤-21.20 | PASS |
| | | High | 2480 | AV | 2483.500 | -44.19 | ≤-41.20 | PASS |
| | | | | AV | 2484.080 | -43.49 | ≤-41.20 | PASS |
| | | | | AV | 2500.000 | -46.99 | ≤-41.20 | PASS |
| | | | | Peak | 2483.500 | -38.15 | ≤-21.20 | PASS |
| | | | | Peak | 2484.400 | -35.77 | ≤-21.20 | PASS |
| | | | | Peak | 2500.000 | -41.12 | ≤-21.20 | PASS |
| 3DH5 | Ant1 | Low | 2402 | AV | 2310.000 | -48.07 | ≤-41.20 | PASS |
| | | | | AV | 2388.200 | -47.53 | ≤-41.20 | PASS |
| | | | | AV | 2390.000 | -47.54 | ≤-41.20 | PASS |
| | | | | Peak | 2310.000 | -41.78 | ≤-21.20 | PASS |
| | | | | Peak | 2365.415 | -37.87 | ≤-21.20 | PASS |
| | | | | Peak | 2390.000 | -40.7 | ≤-21.20 | PASS |
| | | High | 2480 | AV | 2483.500 | -44.12 | ≤-41.20 | PASS |
| | | | | AV | 2484.080 | -43.43 | ≤-41.20 | PASS |
| | | | | AV | 2500.000 | -47.02 | ≤-41.20 | PASS |
| | | | | Peak | 2483.500 | -39.53 | ≤-21.20 | PASS |
| | | | | Peak | 2484.320 | -36.66 | ≤-21.20 | PASS |
| | | | | Peak | 2500.000 | -40.64 | ≤-21.20 | PASS |

Note:

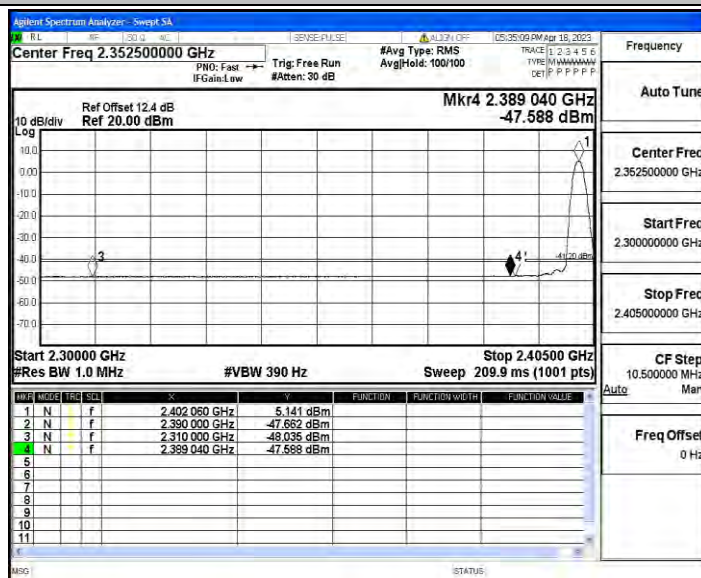
1. The Antenna Gain is compensated in the graph with 2dBi and Antenna Gain which is Higher.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

Test Graphs

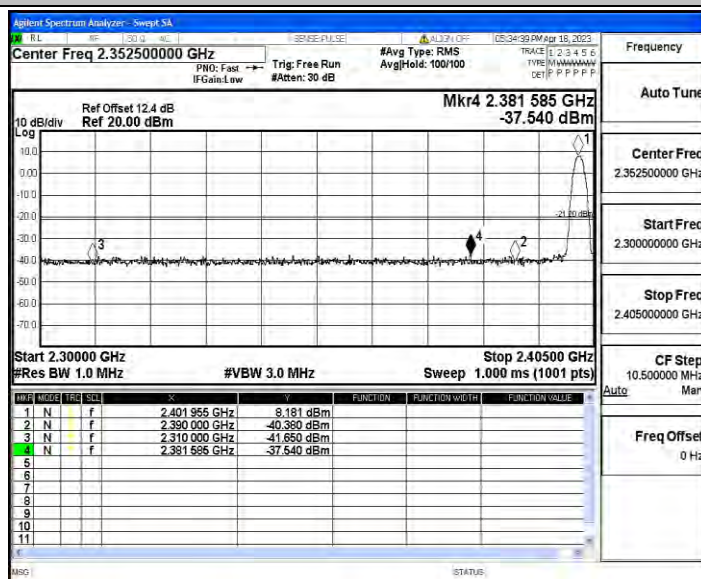




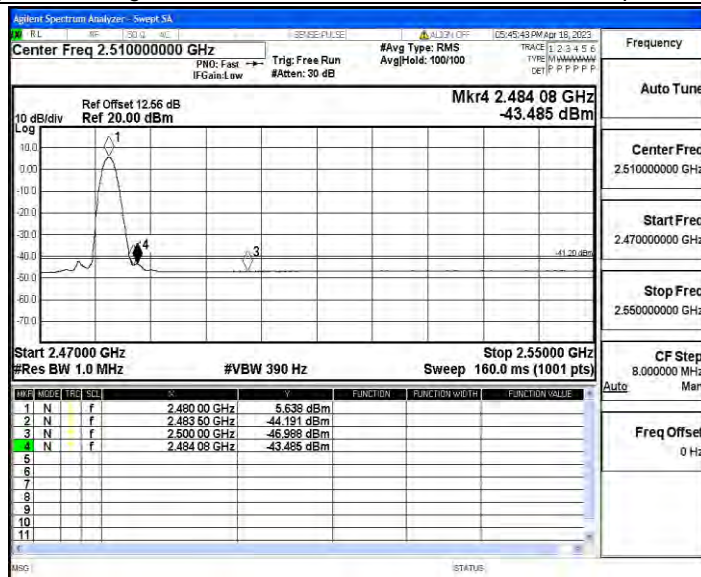
2DH5_Ant1_Low_2402_AV



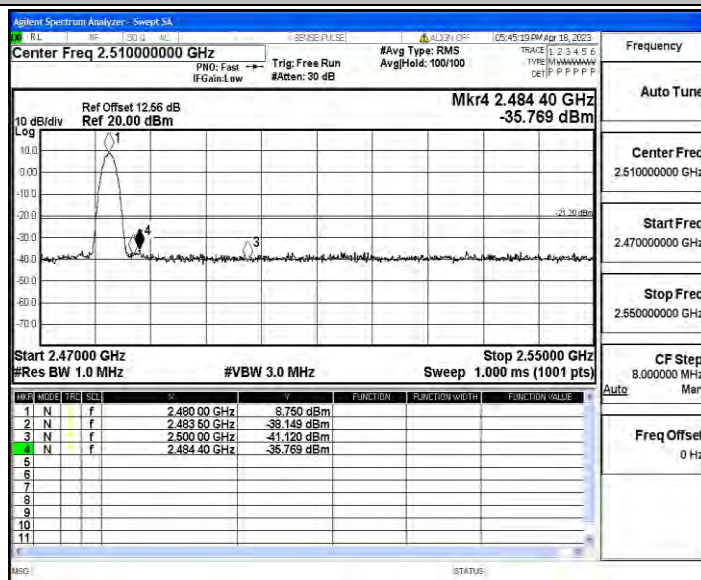
2DH5_Ant1_Low_2402_Peak



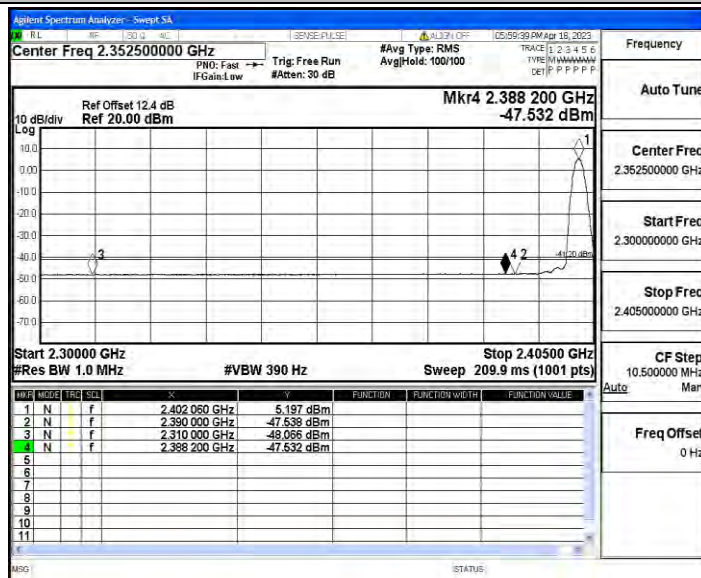
2DH5_Ant1_High_2480_AV



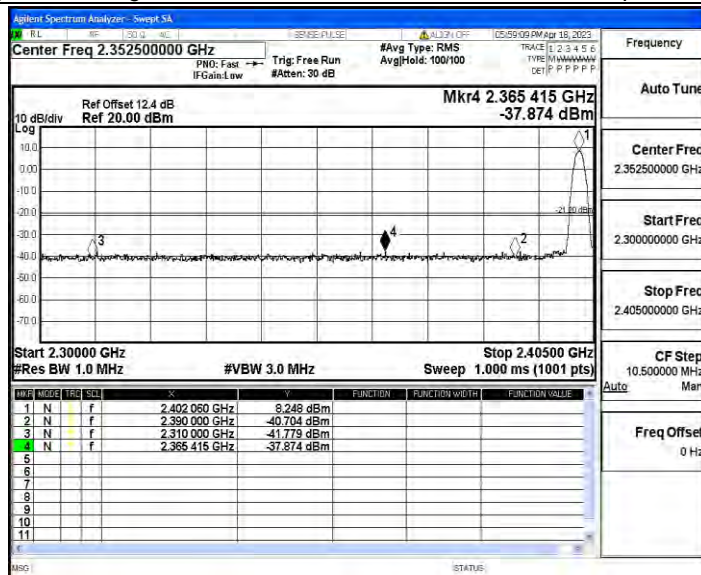
2DH5_Ant1_High_2480_Peak



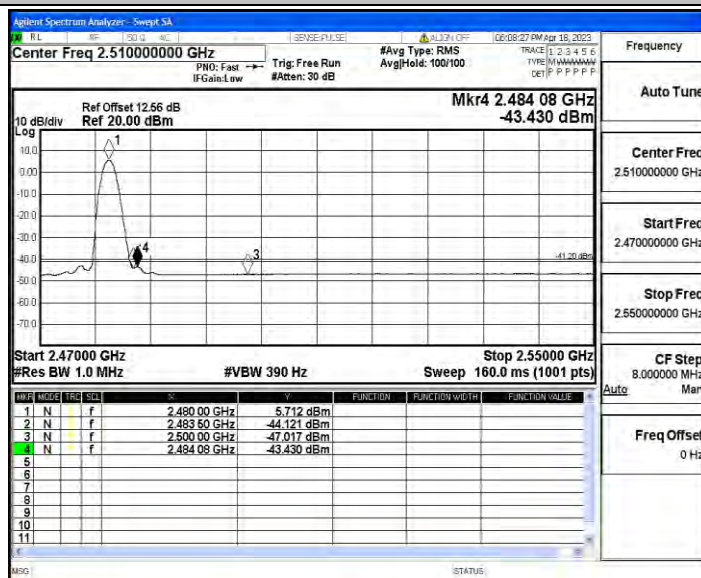
3DH5_Ant1_Low_2402_AV



3DH5_Ant1_Low_2402_Peak



3DH5_Ant1_High_2480_AV



3DH5_Ant1_High_2480_Peak

